Instructions for Use

Leica IP S -

Printer for slides

Leica IP S, V 1.9 RevD, English – 05/2013
Order No: 14 0601 85101, RevD

Leica IP S

Printer for slides

CE

Instructions for Use

Leica IP S

Order No. 14 0601 85101 RevD

V 1.9 RevD, English - 05/2013

Always keep this manual with the instrument.

Read carefully before working with the instrument.

Leica MICROSYSTEMS

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For the instrument serial number and year of manufacture, please refer to the name plate at the back of the instrument.

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1.1 Symbols in the text and their meanings

Warnings
appear in a gray box and are marked by a warning triangle ⚠.

Notes
i.e. important user information appear in a gray box and are marked by an information symbol i.

Inflammable solvent and reagents are marked with this symbol.

Instrument surfaces which become hot during operation are marked with this symbol.
Avoid direct contact with these surfaces - they may cause burns.

Warning – Dangerous electrical voltage.

(5) Numbers and parentheses refer to item numbers in the illustrations.

LOAD Function keys to be pressed on the touch screen are written in bold-print capital letters.

Manufacturer

Observe the Instructions for Use.

SN Designates the serial number of the instrument.

REF Order number for standard delivery or accessories.

Symbol for alternating current

CE labeling shows that the product corresponds to one or more applicable European directives.

Environmental protection symbol of the China RoHS directive. The number in the symbol indicates the "Environment-friendly Use Period" of the product. The symbol is used if a substance restricted in China is used in excess of the maximum permitted limit.

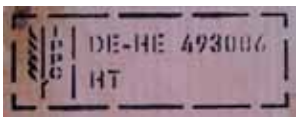
Symbol for labeling electrical and electronic equipment in accordance with Section 7 of the German Electrical and Electronic Equipment Act (ElektroG). ElektroG is the law regarding the sale, return and environmentally sound disposal of electrical and electronic equipment.

1.1.1 Symbols on the transport packaging and their meanings

The package contents are fragile and must be handled with care.

Indicates the correct upright position of the package.

The package must be kept in a dry environment.



Example of labeling in accordance with IPPC

- IPPC symbol
- Country code in accordance with ISO 3166, e.g. DE for Germany
- Regional identifier, e.g. HE for Hessen
- Producer/treatment provider code, unique assigned number starting with 49
- Treatment code, e.g. HT (heat treatment), MB (methyl bromide), and possibly DB (debarked)

Package labeling in accordance with German Hazardous Freight Ordinance Road and Rail (GGVSE)/European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) for transporting hazardous goods.

Class 3: "FLAMMABLE LIQUID" - Flammable liquid substance.

Tip-n-Tell indicator to monitor whether the shipment has been transported and stored in upright position according to your requirements. With a pitch of 60° or more, the blue quartz sand flows into the arrow-shaped indicator window and sticks there permanently. Improper handling of the shipment is immediately detectable and can be proven definitively.

1.2 Qualification of personnel

- The Leica IP S may be operated by trained laboratory personnel only.
- All laboratory personnel designated to operate this instrument must read these Instructions for Use carefully and must be familiar with all technical features of the instrument before attempting to operate it.

1.3 Intended use of instrument

Leica IP S printer system for standard specimen slides.

- The instrument has been designed for use in pathology, histology, cytology, toxicology and similar laboratories, and there only for standard specimen slides.
- Imprints of adequate quality and resistance to subsequent processing in tissue processors can only be guaranteed when using the specimen slides and reagents specified in Chapter 3.3.
- The instrument must be used exclusively according to the instructions contained in these Instructions for Use.

Proper and intended use includes the observance of all instructions in the Instructions for Use and compliance with all inspection and maintenance instructions.

Any other use of the instrument is considered improper!

1.4 Instrument type

All information provided in these Instructions for Use applies only to the instrument type indicated on the cover page.

A name plate indicating the instrument serial number is attached to the back of the instrument.

Fig. 1

Fig. 1 is provided as an example only and shows a valid nameplate for this instrument with the necessary information about instrument type and power requirement. The precise data for the various versions is specified in Chapter 3.2, "Technical data".

Make sure to comply with the safety instructions and warnings in this chapter.
Make sure to read these instructions, even if you are already familiar with the operation and use of other products.

2.1 Safety instructions

These Instructions for Use include important instructions and information related to the operating safety and maintenance of the instrument. The Instructions for Use are an important part of the product, and must be read carefully prior to startup and use and must always be kept near the instrument.

This instrument has been built and tested in accordance with the safety regulations for electrical measuring, control, regulating and laboratory devices.
To maintain this condition and ensure safe operation, the user must observe all notes and warnings contained in these Instructions for Use.

These Instructions for Use must be appropriately supplemented as required by the existing regulations on accident prevention and environmental safety in the operator's country.

The protective devices on both instrument and accessories may neither be removed nor modified. Only authorized and qualified service personnel may access and repair the internal components of the instrument.

Use only the provided power cable - this must not be replaced with a different power cable. If the power plug does not fit in your socket, contact our service.

Residual risks
The instrument has been designed and constructed with the latest state-of-the-art technology and according to recognized standards and regulations with regard to safety technology. Operating or handling the instrument incorrectly can place the user or other personnel at risk of injury or can cause damage to the instrument or other property. The machine may be used only as intended and only if all of its safety features are in proper working condition. Malfunctions that impede safety must be remedied immediately.

For current information about applicable guidelines, please refer to the CE declaration of conformity and on our Internet site at:
http://www.LeicaBiosystems.com

2.2 Warnings

The safety devices installed in this instrument by the manufacturer only constitute the basis for accident prevention. Primarily responsible for accident-free operation is above all the institution which owns the instrument and, in addition, the designated personnel who operates, services or repairs the instrument.
To ensure trouble-free operation of the instrument, make sure to comply with the following instructions and warnings.

Warnings—Transport and Installation

- **Once unpacked, the instrument may be transported only in an upright position.**
- **Do not expose the instrument to direct light (window, lamps with strong light)!**
- **Only connect the instrument to a grounded power socket. Do not interfere with the grounding function by using an extension cord without a ground wire.**
- **Do not operate the instrument in rooms with explosion hazard.**
- **Condensation water may form in the instrument, if there is an extreme difference in temperature between the warehouse and the installation site and if air humidity is high at the same time. If this is the case, wait at least two hours before switching on the instrument. Failure to adhere to this waiting period may result in damage to the instrument.**

Warnings—Markings on the instrument itself

- **Markings on the instrument showing the warning triangle indicate that the correct operating instructions (as defined in these Instructions for Use) must be followed when operating or replacing the item marked.**
- **Failure to adhere to these instructions may lead to accidents causing personal injury and/or damage to the instrument or accessories or destroyed, unusable slides.**
- **Some instrument surfaces become hot during operation. They are marked with this warning label. Touching these surfaces may cause burns.**

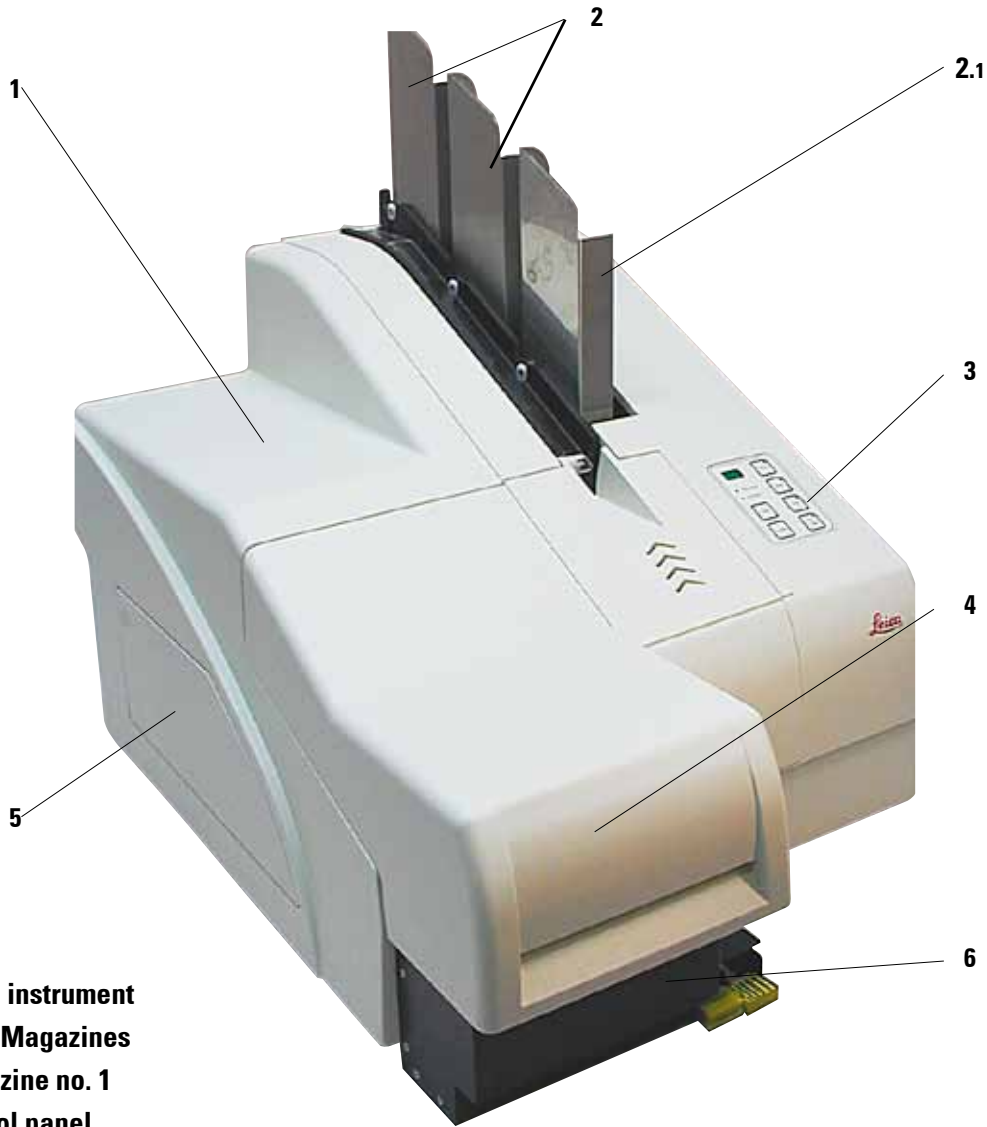
Warnings—Instrument operation

- **The instrument may be operated by trained laboratory personnel only. It must only be operated for the purpose of its designated use and according to the instructions contained in these Instructions for Use.**
- **The instrument is de-energized after disconnection of the power supply through the power cable (power supply circuit breaker) - in emergencies, disconnect the power plug.**
- **Do not touch the chute during operation. Risk of injury.**
- **Do not open the reflector flap of the flashlight while the instrument is ON—risk of burns and blinding.**
- **The device operator is obligated to conform to the local workplace limit values and to document them.**

Warnings—Cleaning and maintenance

- **Before any maintenance, switch off the instrument and unplug it from power supply.**
- **To clean the exterior surfaces, use a mild and ph-neutral commercial household cleaner. You may NOT use: Alcohol, cleaning materials containing alcohol (glass cleaner!), abrasives, or solvents containing acetone or xylene!**
- **The painted surfaces and the control panel of the instrument are not resistant to xylene or acetone!**
- **While working and during cleaning, no liquid may get into the interior of the instrument.**

3.1 Overview—instrument



1 - Basic instrument
2 - Slide Magazines
2.1 - Magazine no. 1
3 - Control panel
4 - Lid
5 - Cover—cartridge slot
6 - Unload station (manual)

Fig. 2

Front view without lid

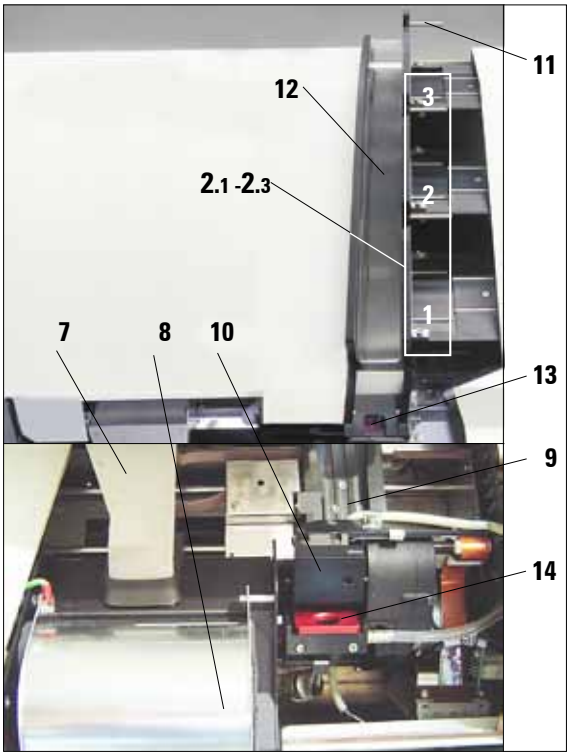


Fig. 3

2.1-2.3 - Magazine receptacles nos. 1 - 3
7 - Drying module
8 - Cover—flash bulb
9 - Cassette carrier
10 - Print head
11 - Magazine holder
12 - Feeding chute with cover
13 - Transfer point: chute --> cassette carrier, with sensor
14 - Location plate
15 - External alarm jack
16 - Socket for printer cable

Rear panel and electrical connections

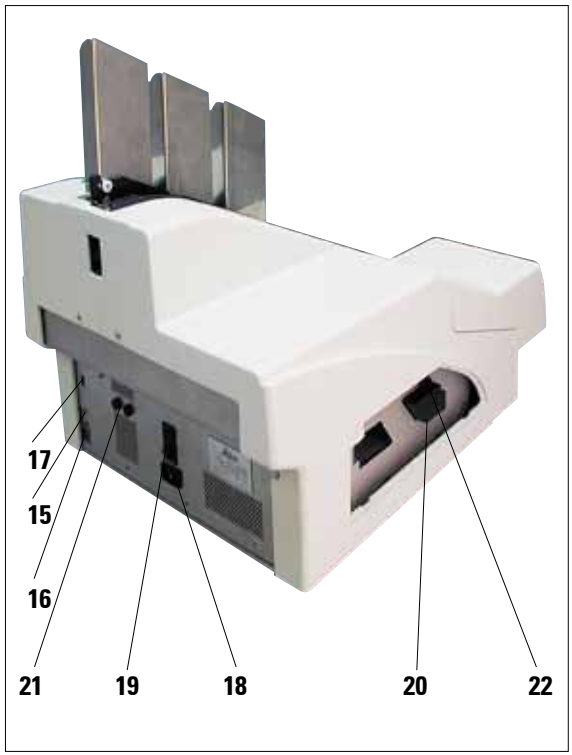


Fig. 4

17 - DIL switch
18 - Power supply connection
19 - Power switch
20 - Cleaning cartridge
21 - Secondary fuses
22 - Drawer for broken glass

Attention for pos. 20.
The instrument is delivered with the storage cartridge installed!
Prior to operation, the cleaning cartridge must be exchanged for an ink cartridge - see Chapter 4.10, "Exchanging the cartridge".

3.2 Technical data

General

Approvals:	The instrument-specific approval marks are located at the rear panel of the instrument, next to the name plate.
Nominal supply voltages:	100 to 120 V ~ +/- 10 % 200 to 240 V ~ +/- 10 %
Nominal frequency:	50 to 60 Hz
Power fuse:	2x T 3.15 A L250 V
Maximum power draw at 100 - 120 V:	4.0 A
Maximum power draw at 200 - 240 V:	2.8 A
Leakage current at 240 V/50 Hz:	ca. 2.4 mA
Nominal power:	700 VA
IEC 1010 classification:	Protection class 1, pollution degree 2 Overvoltage installation category II
Operating elevation:	up to max. 2000 m NN
A-weighted noise level:	≤ 70 dB (A)
IP protection class (IEC 60529)	IP20

Climatic conditions for the operation of the instrument:

Temperature:	+15 °C to +30 °C
Relative humidity:	20 - 80 % - non-condensing

Climatic conditions for the storage and transport of the packaged instrument:

Storage temperature range:	+5 °C to +40 °C
Transport temperature range:	-29 °C to +40 °C
Relative humidity:	10 - 85 % - non-condensing

Dimensions and weight

Dimensions of basic instrument	
Width x depth:	475 x 650 mm
Height with magazine:	560 mm
Dimensions with unload station connected	
Width x depth:	548 x 650 mm
Height with magazine:	655 mm
Basic instrument empty weight:	approx. 28 kg
Weight, packed:	approx. 65 kg
Unload station empty weight:	approx. 14 kg
Weight, packed:	approx. 32 kg

Performance

Load capacity:	up to 3 magazines, up to 150 slides per magazine
Printing speed [1]:	
Printing batch jobs:	14 slides/minute (two-line printing)
Single-cassette printing:	10 s per slide
Ink cartridge capacity [2]:	approx. 60,000 printouts or 3.5 months
Flash bulb lifetime:	approx. 150,000 flashes

Printing

Print resolution [3]:	360 x 360 dpi / 180 x 180 dpi, adjustable
Printing medium:	Glass specimen slide with coated field 76 x 26 mm, max. 1.2 mm thick
Print format:	Slide
Pressure surfaces:	max. 25.4 x 18.0 mm

PC system requirements

IBM-compatible PC	
Processor clock frequency:	min. 800 Mhz
Main memory (RAM):	min. 256 MB
Hard disk:	min. 6 GB
CD-ROM drive	
1 free serial port	
Operating system:	Windows NT, Windows 2000, Windows XP Windows VISTA, Windows 7 (32 bit and 64 bit)

1) Average value—exact speed in each individual case depending on system configuration and the software used.
2) Average value—exact number of cassettes in each individual case depending on quantity being imprinted and on density of imprint.
3) Measured in addressable dots per inch

3.3 Print specifications

Only standard specimen slides with imprintable colored edges (**23**) can be imprinted in the Leica IP S (see Fig. 5).

Printing directly onto the glass is not possible.

Specimen slides with the following dimensions can be processed: 76 x 26 mm, max. 1.2 mm thick.

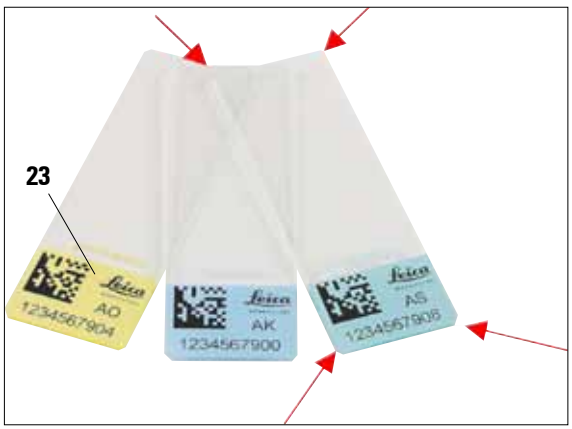


Fig. 5

The texture of the slide print surface is extremely important for optimal print quality and durability. The print surface varies considerably between manufacturers, color selection and coated (positively charged) versus uncoated surfaces.
They can even vary greatly from slide to slide in the same lot. Colored print surfaces, other than pure white, contain pigments that help the ink spread evenly and adhere strongly.

Specimen slides with a white printed surface should be checked for print quality and ink resistance before purchase.
Some slides have been coated over the print surface as well as the glass, which can create problems with the adherence of the ink. These slides should also be tested for print quality and ink adherence before purchase.

3.3.1 Requirements for specimen slides

- To reduce the amount of glass dust and the risk of mechanical failures, use only clipped corner slides (45° angle on each corner, Fig. 5).
- Slides to be used in the printers must be stored appropriately in closed containers and protected from dust and moisture.
- Positively charged slides are inherently sticky so they require special handling to insure reliable mechanical handling by the instrument.
- When the print job is complete, the printed surface of the slide may be handled immediately. Please be aware, however, that the special ink is alcohol-based and exposure to alcohol in combination with physical contact (rubbing) could cause the print quality to degrade significantly.

Tested and recommended print media for the Leica IP S ink jet printer

Important!
The use of other print media may result in unsatisfactory print quality and/or jamming of slides/ cassettes during the printing process!
If the specimen slides you are currently using are not listed above, please contact your local Leica Biosystems representative.

Specimen slides recommended by Leica are:

- Leica Snowcoat® Clipped Corner Slide
- Leica Clipped Corner X-tra® Adhesive Slides

Caution!
Slides made by other manufacturers must be tested before use.
The test must include the following steps:
Mechanical compatibility with the instrument.
Imprint quality.
Chemical and mechanical resistance of the imprints against the reagents the slides will be exposed to during the subsequent processing steps (see also Chapter 3.3.4).
Important!
Leica Biosystems assumes no responsibility whatsoever for any damages suffered as a consequence of imprints of poor quality or imprints made with non-reagent-resistant ink.

3.3.2 Print specifications

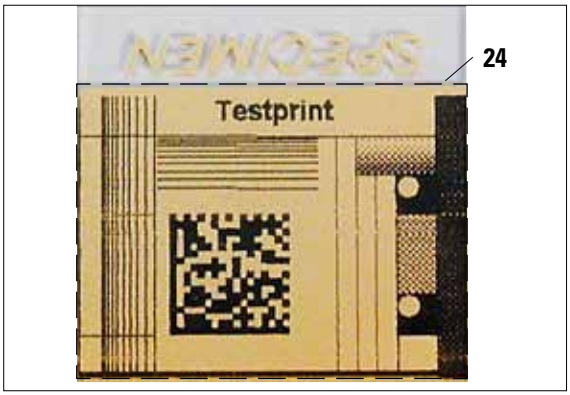


Fig. 6

Printing area

The printing area parameters listed in the table below are defined in the printer driver.

	Width		Height	
Format	Dots	mm	Dots	mm
Slide	360	25.4	256	18.0

Print resolution

The print head of the instrument has a preset resolution of 360 dpi in both directions (vertical and horizontal).
Each printed line has a maximum height of 128 dots.
This corresponds to a value of 9.03 mm.
Therefore, a maximum of 2 lines can be printed on the slides.
In horizontal direction, the printable surface is limited only by the size of the object to be imprinted (Fig. 6).

The above values must be taken into consideration when defining the print area ("paper size") in the application you are going to print from.

Print quality

Quality and resolution of the imprints depend on:

- the material of the imprintable surface/the dyes used to color the imprintable surface.
- the structure of the imprintable surface (**24**).

The final resolution of the imprints is not determined only by the resolution of the print head.

If the slide surface is not capable of 360 dpi resolution, "running" ink will lead to poor printing results. In such cases it is better to work at a lower resolution.

The printer driver allows you to change the resolution from 360 dpi to 180 dpi.

(For more information, see Chapter 5.4).

3.3.3 Printing bar code

Printing readable bar code depends on various factors that need to be taken into consideration in order to achieve results suitable for reliable and durable archiving. The main factors influencing the bar code results are:

- printer technology
- how the bar code is created
- the type of object being printed on
- the type of scanner used to read the bar code

Printer technology

- As a dot matrix printer, the IP S can handle information only in the form of dots printed or not printed. It is not possible to transmit bar code data or to select specific bar code types or use the printer to create and print the bar code required.

Creating bar codes

- Since there is only limited printing space on the slides, the bar code should not contain more information than necessary.
- You should use an error-checking code, which makes it easier for the bar code scanners to recognize possible errors. Some codes even support error correction.
- When calculating and creating bar code, always bear in mind the resolution of the printer.
  The module size is the width of the smallest element of a bar code. Wider bars and spaces are calculated in multiples of the module size.
  The module size always has to be an entire divisor of the printer resolution, as, due to the technology applied, only 'whole' dots can be printed. Reading errors may occur (even if the print appears to be crisp and correct), if, due to conversion, module width and resolution do not match any longer.

Data should never be printed as bar code only, but also as text (line of optical characters above or below the bar code), to ensure that no information is lost for the above reasons.

Requirements for bar code printing

The quality and readability of printed bar codes will depend on several factors that include:

- Texture and quality of the print surface on the selected surface of the slide
- The color of the title block
- Bar code style (1D or 2D)
- Number and types of characters required in the bar code
- The quality and resolution capabilities of the bar code reader

As always, using Leica recommended print media will produce the highest quality print. However, it is highly recommended that any bar code solution be tested prior to implementation. Please check with your local representative for details on achieving the maximum number of characters with 2 D bar codes.

Bar code scanners

The scanning results obtained not only depend on the correct bar code creation and on the quality of the specimen slides, but also on the features of the bar code scanner used.

Features to bear in mind are:

- Reading tolerance:
  difference between actual bar width and nominal module size.
- Light color:
  In order to obtain a high contrast with the specimen slides used.
- Optical resolution:
  must be better than the module size.

Depending on the application, the following features should also be considered:

- Maximum readable distance
- Maximum inclination angle

Leica has successfully tested the following readers:

Symbol DS 6707 Bar code Scanner

Fig. 7

3.3.4 Resistance against reagents

Caution!
All laboratories must perform their own tests to ensure that the ink is resistant against the various reagents the slides will subsequently be exposed to.
A wide range of factors beyond Leica's control can have negative effects on the results.
The test conditions stated below can therefore only serve as an outline for individual laboratory test specifications.
The laboratory operating the unit shall bear full responsibility for the legibility of the imprint after processing with reagents.

Test conditions

Imprinted slides were tested with a variety of reagents in an environment simulating the conditions present during tissue processing.

The following slide types were tested:

- Leica – Snowcoat® Clipped Corner Slide
- Leica – Clipped Corner X-tra® Adhesive Slides
- Erie Scientific – Superfrost (plain and plus)
- Knit tel GmbH – Printer slides, adhesive slides
- Marienfeld – Unimark
- Menzel – Superfrost, Superfrost Plus
- Thermo – Colorfrost Plus

A variety of colors of all of the above slide types (although not all colors available of each slide type) were tested.
An influence of the slide color on the resistance of the imprint could not be verified.

It cannot be guaranteed that the ink will be absolutely smudge-proof under all foreseeable laboratory conditions, as stability of the ink against wiping largely depends on the surface structure of the imprint field of the slide being imprinted.

Important!
The imprint field of imprinted slides should never be touched or wiped while damp.

4. Instrument Setup

4.1 Site requirements

The instrument must not be operated in areas at risk of explosion.
To ensure proper function of the instrument, it must be set up while maintaining a minimum distance of 10 cm from walls and furniture.

- The instrument requires an installation area of approx. 650 x 550 mm.
- Relative humidity 80 % maximum - non-condensing
- Room temperature consistently between +15 °C and +35 °C
- Elevation: up to max. 2000 m NN
- The instrument is designed for indoor use only.
- The power plug/circuit breaker must be freely and easily accessible.
- Power supply at a distance no greater than the length of the power cable – an extension cable must NOT be attached.
- The bench must have a sufficient load capacity and rigidity with respect to the weight of the instrument.
- Avoid vibrations, direct sunlight, and large temperature fluctuations. The installation location must be well ventilated, and must contain no sources of ignition of any kind.
- The instrument must be connected to a grounded power socket.
  Only a power cable provided which is intended for the local power supply may be used.
- The installation location must be protected against electrostatic discharges.

4.2 Unpacking the Instrument

When the instrument arrives, check the tilt indicator (1, Fig. 8) on the package. If the arrowhead is blue, the shipment was transported laying flat, was tilted at too great an angle or fell over during transport.
Note this on the shipping documents and check the shipment for possible damage.
Only personnel authorized by Leica may unpack and install the instrument.

Fig. 8

- Unscrew the 8 screws (**2,** Fig. 8) on the sides of the wooden box and loosen the cover.
- Remove the accessory box (**7,** Fig. 9) including accessories and packaging material) - directly under the lid.
- Unscrew the 8 screws (**3,** Fig. 8) on the floor of the wooden box on the exterior.
- Remove the interior carton around the instrument.
- Carefully remove the wooden box from the baseplate.
- The printer is secured with 4 plates (**5**) on the wooden floor of the outside box. Loosen the two screws (**4,** Fig. 10) on the base of the instrument. Remove the plate from the bottom.
- Place the printer from the baseplate on a stable laboratory bench - or, if present, on the automated unload station. Make sure that the stage is leveled!

When unpacking the printer, at least two people (one person on each side of the printer) are required to lift the printer out of the box and place it onto the laboratory bench.

Fig. 9

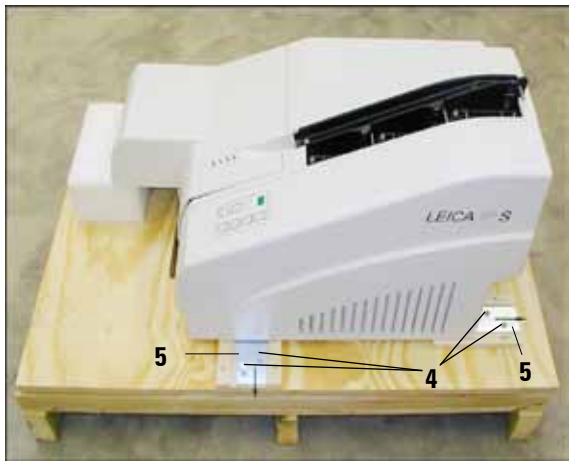


Fig. 10

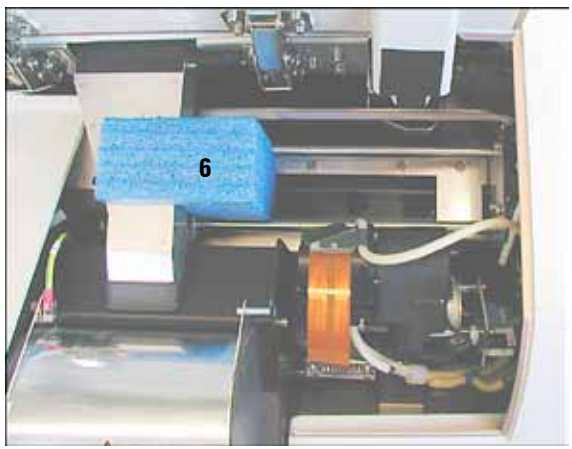


Fig. 11

- If the instrument was set up at its final area of use, remove the blue foam transport anchor (**6,** Fig. 11) (pull upwards).

4.3 Installing the printer

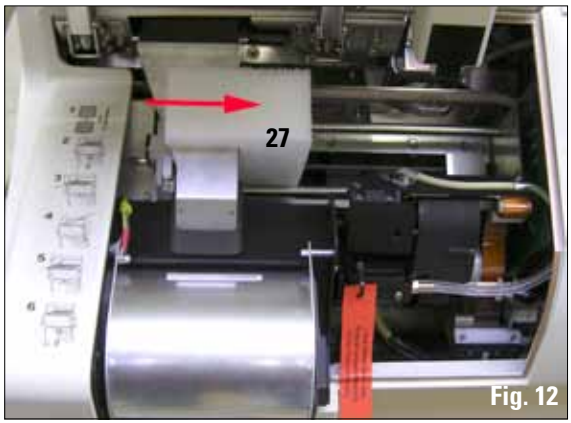


Fig. 12

Carefully pull out the transport anchor (**27**) of foam that protects the print head by pulling it to the right.
Carefully remove any adhesive tape remnants.

When unpacking the printer, at least two people (one person on each side of the printer) are required to lift the printer out of the box and place it onto the laboratory bench.

- Check instrument for damage (do not switch on in the case of damage!).
- Check delivered accessories for completeness according to purchase order.
- Remove the transport anchor (**27,** Fig. 12).
- Carry out the following installation steps:
  - Install the accessories.
  - Insert shielding glass (Fig. 16).
  - Insert the flash bulb.
  - Connect to the power supply.
  - Exchange the cartridges.
  - Establish data connection to PC.
  - Install printer driver.
  - Fill the magazines with specimen slides.
  - Run a test print.

4.4 Standard delivery—packing list

The standard equipment of the Leica IP S includes the following parts:

1 Leica IP S, basic instrument without unload station	14 0601 33201
1 Cleaning cartridge (in the instrument)	14 0601 42865
1 UV ink cartridge Leica	14 0601 42350
1 Unload station S (manual), complete	14 0601 35990
1 Accessory kit consisting of:	14 0601 38350
1 Flash bulb	14 0601 37152
3 Magazines for slides, (1 pack of 3)	14 0601 36689
1 Set of power cords:	
1 Power cord for UK ST/BU F-5A	14 0411 36959
1 Power cord for Germany	14 0411 36958
1 Power cord for USA/Canada/Japan	14 0411 36960
1 Printer cable, serial	14 0601 37044
1 Tool set, consisting of:	14 0601 37000
1 Slotted screwdriver 4 x 100	14 0170 38405
1 Allen key size 2.5	14 0222 04137
1 Leica brush	14 0183 30751
1 Set of replacement fuses:	
2 Fuses 3.15 A T (5 x 20 mm)	14 6943 03150
1 Protecting block (in the instrument)	14 0601 39615
2 Shielding glass	14 0601 42533
2 Location plates	14 0601 40162
2 Transport plates	14 0601 40196
1 Cleaning swabs, pack of 25	14 0601 39637
1 Instructions for Use, english	14 0601 85101
1 Language CD (+ printer driver with documentation)	14 0602 80200

Optional accessories:

• Automated multi-level cassette unload station (for Leica IP S)	14 0601 33225
• Set of slide trays for unload station S (pack of 10)	14 0601 33252
• Magazine holder "S" for 6 magazines	14 0601 36940
• Magazine loading help	14 0601 35979
• Cartridge kit, 310 ml	14 0601 43506

4.5 Installing the manual unload station

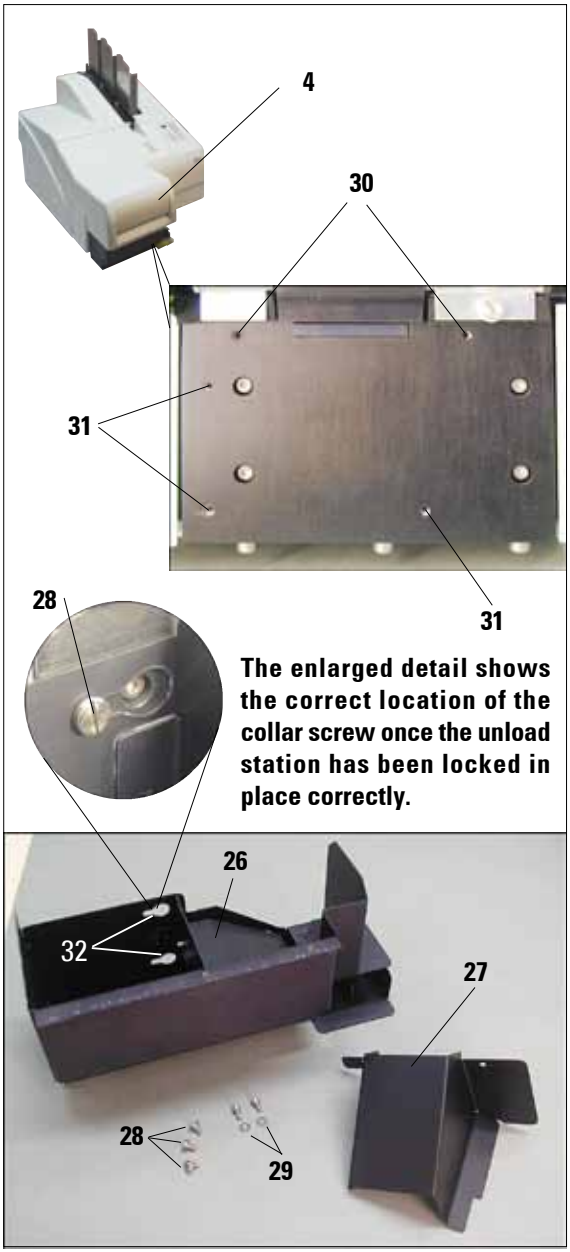


Fig. 13

The unload station supplied consists of:

26 - Unload station
27 - Screening plate
28 - Collar screws (3 pcs.)
29 - Slotted screws with washers (2 pcs.)

Install as follows (Fig. 13):

- Open lid (**4**).
- There are 5 tapped holes (2 x item no. **30** and 3 x item no. **31**) in the installation surface located below the reflector.
- With a screwdriver, insert 3 collar screws (**28**) in tapped holes (**31**) as far as they will go.
- Then, fasten cover (**27**) in tapped holes (**30**) using the two slotted screws (and washers) (**29**).
- To fasten the unload station to the instrument, place the wider end of the three oblong holes (**32**) over the heads of the three collar screws (**28**). Press the unload station against the installation surface, pushing it simultaneously to the right until it locks in place (see enlarged detail).
  If the unload station does not easily slide past the shielding cover, slightly lift the front end of the device.
- Close lid, making sure the unload station does not obstruct the lid.

When working with the manual unload station the slides imprinted must be removed in regular intervals. Otherwise they will start piling up in the unload station, printing will stop and error code "44" will be displayed.

4.6 **Automated unload station** (optional)

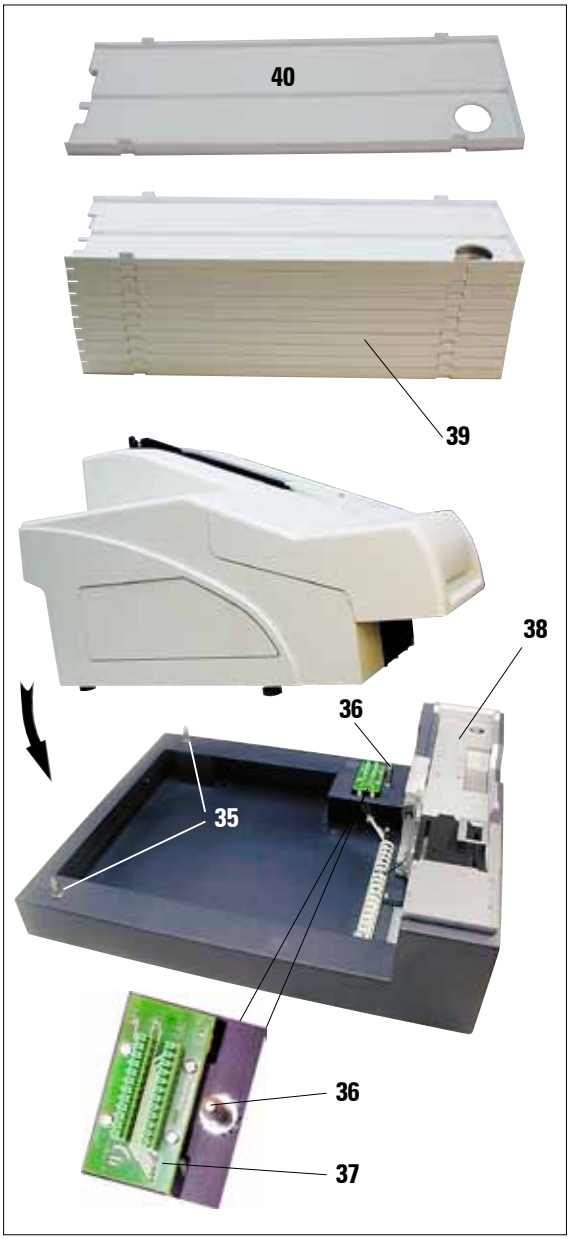


Fig. 14

Optionally available for the printer is an automated multi-level cassette unload station, where the imprinted specimen slides are collected on individually removable and stackable trays (**40**) in the order in which they were printed.

The multi-cassette unload station comes complete with 10 trays, all of which can be inserted simultaneously. Each tray holds up to 11 slides.

Installing the multi-cassette unload station:

- Unpack the unload station and place it on a stable laboratory bench at the installation site.

Important!
Prior to installation, the printer must be switched off and unplugged from power supply.
The manual unload station (chapter 4.5) The collar screws (30, Fig. 13) must also be removed prior to placing the printer onto the automated unload station.

- Place the instrument onto the unload station. **2 persons are required to do this!**
- Hold the printer on both sides (right and left) and first insert the two rear bolts (**35,** Fig. 14) of the unload station into the openings in the base plate of the printer.
  Then carefully lower the front part of the printer unto the third bolt (**36**) so that the plug connection (**37**) locks into place in the printer base plate and the printer remains securely fastened on the unload station.
- Place the stack of trays (**39**) onto the lifting table (**38**) of the automated unload station. See chapter 5.2 for details on the lifting table controls.

4.7 Installing/exchanging the flash bulb

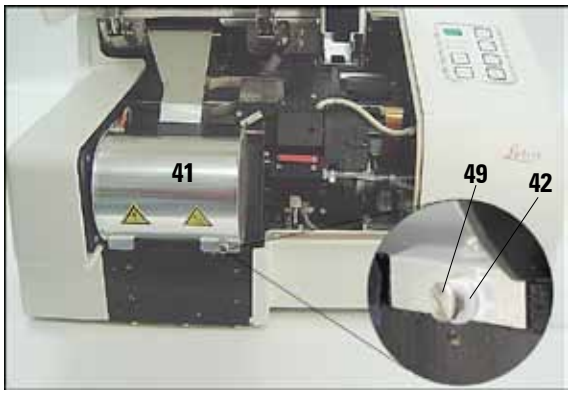


Fig. 15

Removing the old flash bulb

Switch the instrument off and unplug it from power supply.
Allow the flash tube to cool before removing it. Do not handle the flash tube with bare hands. Use a glove or tissue.

- Open the lid (**4**, Fig. 2) to gain access to the reflector.
- Remove screw (**49**) (use screwdriver supplied as part of tool set). Mind the washer (**42**).

Fig. 16

Caution!

To insert/remove, hold the flash bulb as shown in Fig. 17 (right). Do not take hold of the sides of the flash bulb or compress it as shown in Fig. 16.

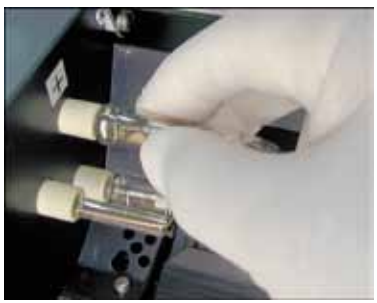


Fig. 17

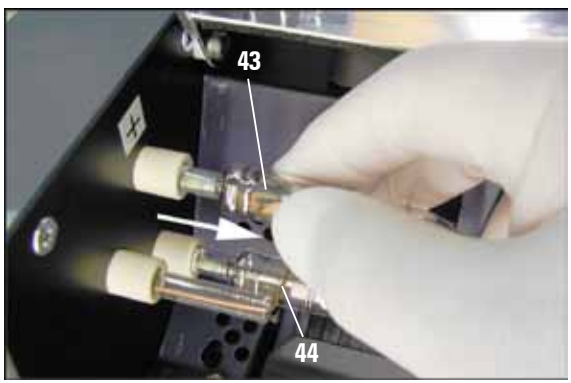


Fig. 18

- Swing the reflector (**41**) upwards.
- Carefully pull out the old flash bulb (**43**) straight to the right, do not twist it. If the flash bulb cannot be pulled out easily, gently rock it back and forth to get it unseated from the socket.
- Make sure the contact spring (**44**) is removed from the priming wire (**45**) of the lamp. (See also Fig. 19 and 22)

Inserting the new flash bulb

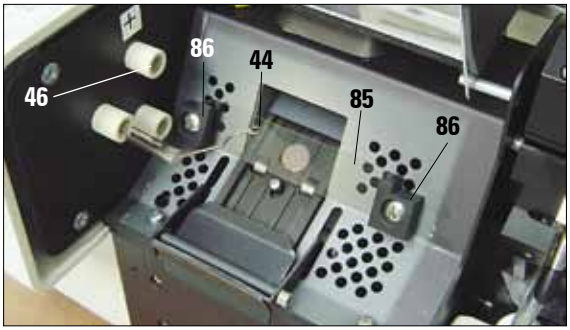


Fig. 19

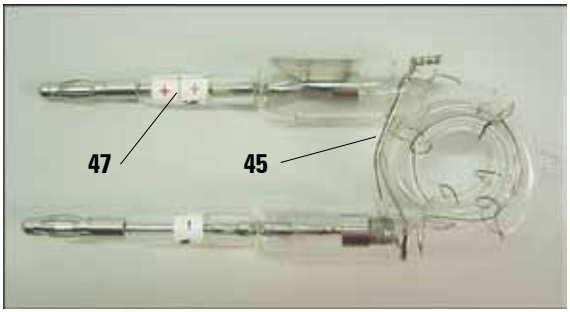


Fig. 20

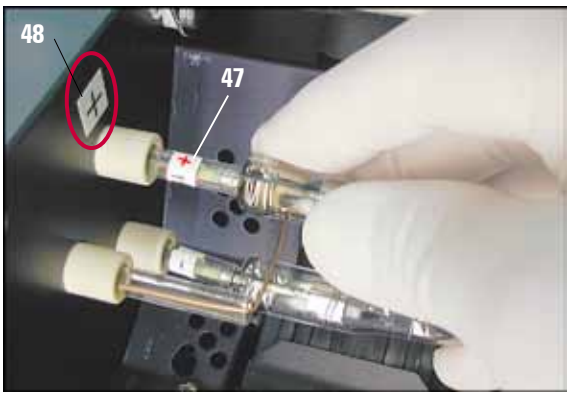


Fig. 21

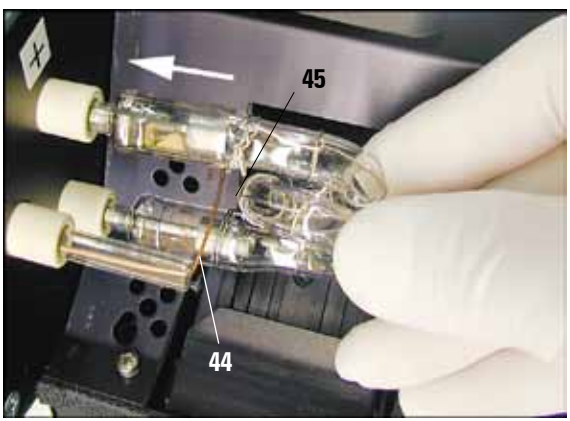


Fig. 22

- Insert the shielding glass (**85**) in the two holders (**86**).
- Insert the new flash bulb into socket (**46**) (Fig. 21); then push it carefully inwards as far as it will go (Fig. 22) (the polarity marker (**+**) must not be visible any longer). If necessary, move flash bulb gently up and down.
- Important! Make sure that the new flash bulb is inserted correctly – the lamp electrode (**47**) marked with a **+** must be inserted into the socket (**46**) that bears the same mark (**48**) (Fig. 21).

Caution!
If the lamp electrodes are inserted the wrong way, the flash bulb will still work, but the lifetime will be significantly reduced.

- The contact spring (**44**) has to touch the ignition wire (**45**) of the lamp after being inserted.
- Swing the reflector downwards. Reinsert and retighten screw (**49**).
- Close lid (**4**) of the instrument again.

4.8 Filling and inserting the magazines

Fig. 23

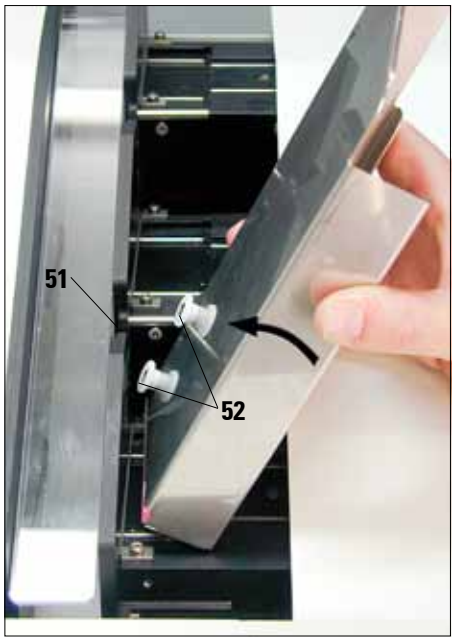


Fig. 24

Fig. 25

Fig. 26

Fig. 27

- Fill one of the magazines (**48**) with slides (**49**). While doing so, ensure that the surface to be imprinted (**50**) is on the left and facing upwards (Fig. 23).
- So that the specimen slides are ejected correctly, ensure that the specimen slides are inserted into the magazine accurately aligned above each other (Fig. 26) and at a right angle to the aperture (Fig. 27).
- Hold magazine (**48**) at a slight angle (Fig. 24) to prevent the specimen slides from falling out of the magazine. Insert magazine into the corresponding receptacle as shown. Both pins (**52**) of the magazine need to lock into slot (**51**).

Filling and inserting the magazines (continued)

Fig. 28

Filling capacities:

Each magazine can hold up to 150 slides (depending on individual slide thickness).

The maximum filling height of a magazine is indicated by the "**max.**" mark (**74**) and may not be exceeded (Fig. 28).

Positively charged slides cling to each other so much that they require special handling to ensure reliable mechanical handling of this type of specimen slide by the printer.

If you are using positively charged slides, please follow the recommendations below:

- Positively charged specimen slides must be separated from each other before they are loaded into the magazine.
- The magazine may be loaded with no more than **72 specimen slides** to prevent problems during ejection. This corresponds to the lowest mark (**75**).
- Even smaller loads will significantly improve the ability of the instrument to eject positively charged slides from the magazine.

4.9 Electrical connection

The instrument must be connected to a grounded power socket.
Of the set of power cords supplied, be sure to use only the one that is appropriate for the local power supply (plug must fit on-site wall outlet).

Back panel of instrument
Electrical connections

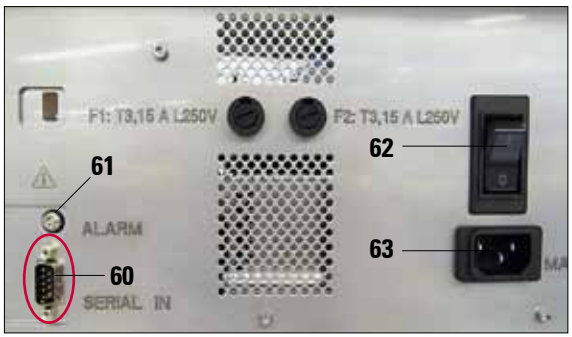


Fig. 29

Connecting to power supply

- Make sure the printer is switched OFF, power supply switch (**62**) in position "**0**" = **OFF**.
- Insert the correct power cord into the power input socket (**63**).
- Switch on power switch (switch to position "**I**"= **ON**).

Once switched on for the first time, the power switch (62) should always remain in position "I" = ON.

Setting up the data connection

- To use the printer, a serial data cable is required (part of standard delivery).

Fig. 30

- Connect the cable to printer port (**60**).
- Connect the cable to one of the serial ports (COM 1, COM 2) of the computer containing the control software.

Connecting a remote alarm device

- If required, connect the external alarm system (optional) to jack (**61**).
- The remote alarm device is connected to the printer via a 3.5 mm-diameter jack connector (optional accessory).
- For details about the remote alarm see Chapter 5.3.

4.10 Exchanging the cartridge

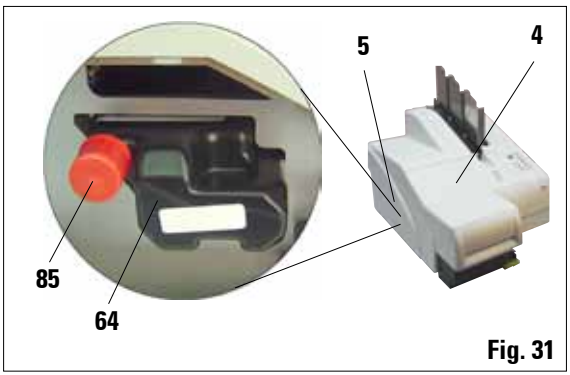


Fig. 31

The printer is supplied with a cleaning cartridge (**64**) inserted. To be able to print, the cleaning cartridge must be exchanged for an ink cartridge.

To do so, proceed as follows:

- Open the cover plate (**5**) on the left side of the instrument (pressing its top left corner).
- Unscrew the red cap (**85**) of the cleaning cartridge (**64**) by one turn (Fig. 31), then switch on the printer using the main switch on the rear side (item (**62**) in Fig. 23) and wait for it to initialize.

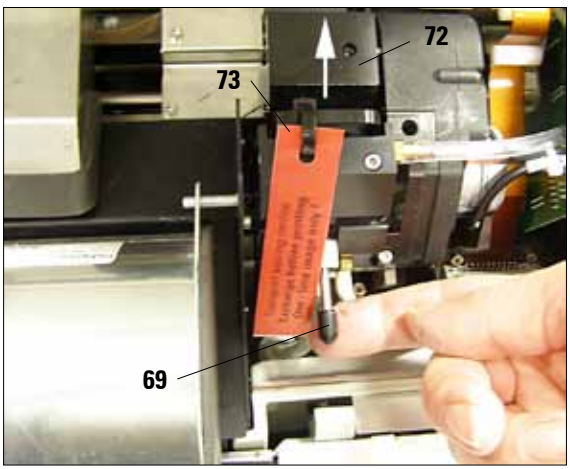


Fig. 32

- Open the hood (**4** in Fig. 31), then press the **CLEAN** and **LOADED** keys simultaneously.

- The print head (**72**) moves upward to a position approx. 1 cm away from the sealing lip (Fig. 32).

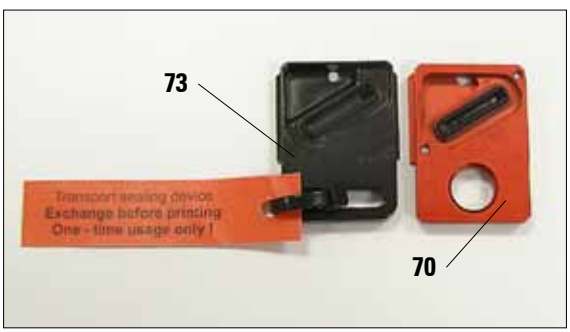


Fig. 33

- Raise the lever (**69**) then remove the black transport plate (**73**) and insert the location plate (**70**), which is required for printing (Fig. 33).

Do not reinstall a used transport plate (73), as it will no longer completely seal the print head.
To prevent damage to the print head, always use the red location plate (70) when printing.

Exchanging the cartridge (continued)

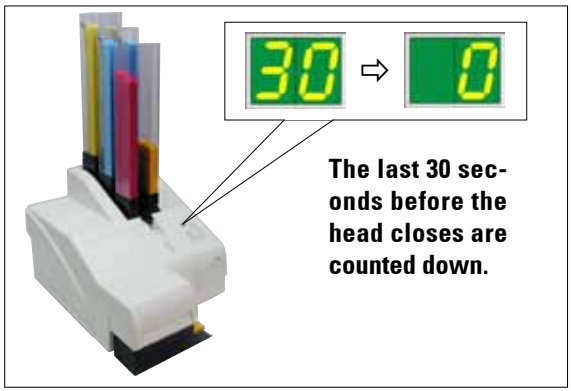


Fig. 34

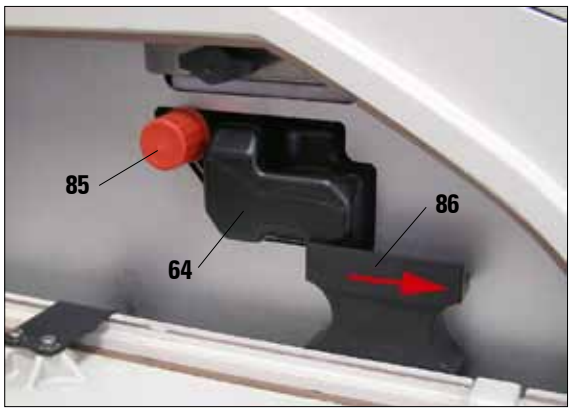


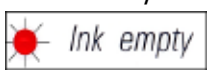
Fig. 35

Fig. 36

- Push the small lever (**69**, Fig. 32) back down into its original position.
- Press any key of the control panel to reposition the print head and make the printer ready to operate.

Caution!
If no key is pressed, the print head will close automatically 150 seconds after opening to prevent it from drying out.
An acoustic signal (5 beeps) will sound after 120 seconds, after which the final 30 seconds will be counted down on the display.

- Push the safety catch (**86**) forwards/to the right (open), so that the cleaning cartridge can be removed (Fig. 35).
- Pull the cleaning cartridge (**64**) approx. 3 cm out of the instrument, retighten the red cap (**85**), then remove the cartridge completely (Fig. 36).
- The activation of a sensor in the cartridge slot blocks all functions so that no air is sucked into the ink system.



The indicator **LED** "Ink Empty" lights up and remains ON.

- Store the removed cleaning cartridge in a sealed container. The cartridge is full and can be used twice more to clean the print head. The expiration date can be found on the red label.

Exchanging the cartridge (continued)

Fig. 37

Fig. 38

Fig. 39

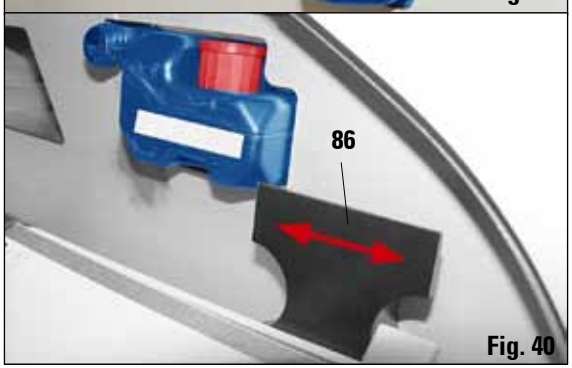


Fig. 40

- Remove the ink cartridge (**66**) from the delivery carton and shake it a few times, then remove the protective foil.
- The ink cartridge must be replaced after 60,000 printouts or 3.5 months. Record the installation date on the white surface (**65**) on the front (Fig. 39).
- Insert the cartridge into the slot. Loosen the red screw-on cap one full turn but do **not** remove it yet.
- Insert the cartridge completely into the receptacle applying moderate pressure. You have to use a certain amount of force to pierce the seals.
- **Withdraw the cartridge by about 1½ inch (30 mm) and push it back in as far as it will go; repeat this step two or three times.**
- Unscrew the red cap (87) completely from the nozzle of the cartridge and store the screw-on cap in the groove indented into the cartridge for that purpose (Fig. 38, 39).

Very important!
Prior to each transport, the cap (87) must be screwed onto the nozzle to prevent the ink from spilling.

- Directly next to the slot opening is a safety catch (**86**, Fig. 40). Moving this catch to the side secures the ink cartridge against falling out.

This step is very important to ensure safe operation of the printer!

Exchanging the cartridge (continued)

- The sensor in the cartridge slot recognizes the presence of a new cartridge.
- The indicator **LED** "Ink Empty" goes out, code "**88**" appears in the display.

At this point, the instrument has to be "told" which type of cartridge has been inserted.
There are three options:

1. **New ink cartridge:**
   Press **LOADED**; the printer sets the ink level meter to 'full'.

2. **Used ink cartridge:**
   Press **ERROR**; the printer resumes measuring at the ink level where it previously left off.

CAUTION!
NEVER press CLEAN while an ink cartridge is in the instrument! The entire contents of the ink cartridge will spill into the printer.

3. **Used or new storage fluid cartridge:**
   Press the key **CLEAN**; the current ink level is stored.

The fill level of the cleaning cartridge is not monitored. Each use should be noted on the cartridge. The cartridge can be used twice. The cycle time when inserting a cleaning cartridge is 3.5 minutes and is thus considerably longer than that of an ink cartridge.

- After one of the three buttons has been pressed, the ink exchange software routine starts; air is evacuated from the hoses and the system is refilled with liquid.
- Display indication "**88**" is extinguished once the ink exchange has been completed.

Running a test print

- Run a test print to verify whether the printing head works correctly.
- For that purpose, fill some specimen slides into a magazine and insert the magazine into magazine position 1.
- Press and hold the **CLEAN** button until "**00**" is displayed, then release the button. A specimen slide is imprinted with a test image stored in the printer for that purpose. If the print result is not satisfactory, this step can be repeated several times.

4.11 Installing the printer driver

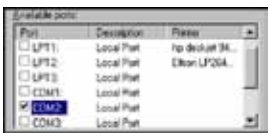
This printer driver only runs under the operating systems Microsoft Windows NT 4.0, Windows 2000 and Windows XP. Installation described is for Windows 2000. Any steps that need to be carried out in a different way when installing under other Windows versions are also explained below.
"Microsoft", "Windows NT", "Windows 2000", "Windows XP" and "Windows 7 (32 bit and 64 bit)" are registered trademarks of Microsoft Corporation.
You must have administrator rights to be able to install the printer driver.

Starting installation:

Add printer wizard

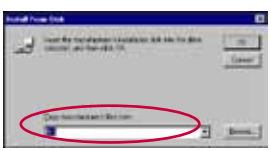
1. Open the printer folder:
   START --> SETTINGS --> PRINTERS
2. Double-click the **ADD PRINTER** icon. The **ADD PRINTER WIZARD**, which guides you through the rest of the installation, is started.

1. The printer is controlled by the computer to which it is connected; therefore, **MY COMPUTER** must be selected.
2. Insert the correct information—according to your current system—in the dialog boxes that follow. Click **NEXT** to move on to the next dialog box.



3. In the next dialog box, an available serial interface (COM 1, etc.) must be selected, as the printer only works with RS 232 interfaces. Do **not** select a parallel printer port (LPT ...)!

4. Next, select the printer manufacturer and model. Click **HAVE DISK...** to open the **INSTALL FROM DISK** dialog box.



5. Insert the CD containing the printer driver (part of standard delivery) into the CD-ROM drive and enter the following path in the input field:
   `X:\IP_Driver\IP_S\English` (for English user interface) and confirm with **OK**. "`X`" is to be replaced by the letter corresponding to the drive containing the CD.

6. In the selection window, select **PRINTERS** IP-S (blue mark).

If no (or other) selectable options are displayed, click on "HAVE DISK..." to return to the previous dialog box and repeat insertion of the path.

7. If the message shown on the left is displayed, the driver has already been installed on your PC on a previous occasion (e.g. interrupted installation or update).
   In this case, be sure to select **REPLACE EXISTING DRIVER**.

8. In the **PRINTER NAME:** box, you can insert any printer name you wish—the printer name you insert will subsequently be displayed in the printer folder and in the **PRINT** menu of all other Windows applications.
   To avoid erroneous printouts, select **NO** when asked whether you want to use this printer as the default printer.

9. Two more on-screen prompts will be displayed:
   - When prompted whether you wish to share the printer in a network, select --> **NOT SHARED**, if the printer is used on a local host.
   - When prompted whether you would like to print a test page, select --> **NO**.

10. Click the **FINISH** button to complete the installation of the printer driver. The printer name selected in step 8 (see above) will be displayed in the printer folder and in all print menus.

When installing under Windows 2000 or Windows XP, at this point the message "DIGITAL SIGNATURE NOT FOUND" will be displayed. This message is displayed simply to inform you that the printer driver has not yet been certified by Microsoft. BE SURE to click YES to continue installing.

11. Finish installation by restarting your computer.

Configuring the serial port:

1. Open the printer folder:
   START --> SETTINGS --> PRINTERS
2. If you right-click on the icon of the newly installed printer, a quick menu opens up.
   Click on **PROPERTIES...**.
3. The **PROPERTIES** window contains several tabs; select the **PORTS** tab.

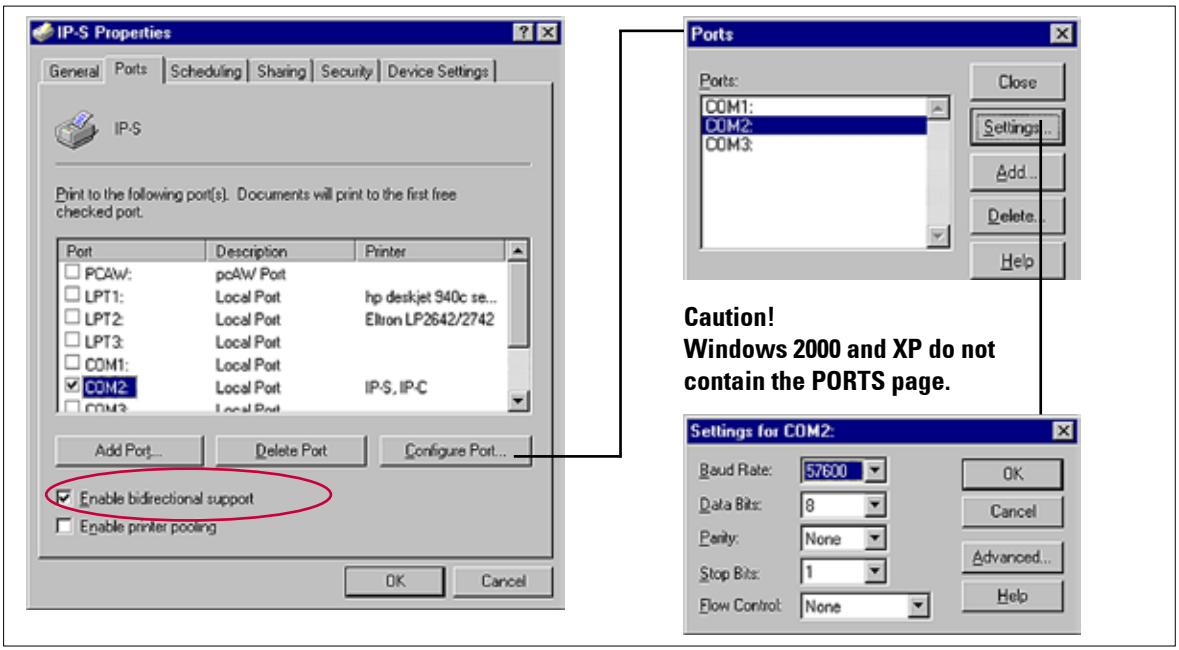


Fig. 41

4. The port selected during installation (COM 2 **in the example here) must be highlighted.** Enable the button **ENABLE BIDIRECTIONAL SUPPORT**.
5. Click on **CONFIGURE PORT...** to open the Ports dialog box. Select the corresponding port and click on **SETTINGS...**. The **SETTINGS FOR...** dialog box opens up. Set **BAUD RATE** to 57600. Leave all other settings as shown in Fig. 41.

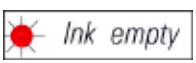
5.1 Control panel functions

Fig. 42

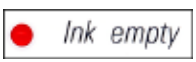
INK EMPTY LED

LED off:

Sufficient quantity of ink remaining—printing is possible without any restrictions.

LED flashing: 

Ink cartridge will be empty shortly—keep replacement ink cartridge handy.

LED illuminates: 

Ink cartridge empty, no further printing possible.

The control panel

- consists of a membrane keyboard with six pressure-sensitive keys (four of them with an **LED**, two **LED** displays and a two-figure seven-segment display.
- controls the printer functions and the print jobs that are defined via the control software.
- indicates current printer status and processes in progress.
- indicates errors and / or error messages.
- controls the (optional) automated multilevel cassette unload station.

MAG. EMPTY LED

LED off:

Magazines are full or up to that point, no further slides have been requested from a magazine that has just been emptied.

LED flashing:

⇨

Flashing LED and number on display indicate which magazine is empty.
If several magazines are emptied at the same time, the corresponding magazine numbers are indicated in a recurring sequence.

After refilling the magazine, **LOADED** must be pressed to inform the printer that the magazine has been refilled.

The printer will resume the interrupted print job where previously left off.

POWER

POWER Switching from POWER ON to STANDBY mode and back

LED illuminated – **POWER ON** mode

- Power is supplied to all printer systems.
- The flash power supply is continuously being recharged.
- The printer is ready to print immediately.

LED flashes – **STANDBY** mode

- All power absorbers of the printer are switched off, with the exception of those related directly to the processor (power saving mode).
- The printer performs a print head clean at regular intervals (e.g. 4 times a day). For that purpose it switches into **POWER ON** mode for a short period of time.

LED off – Printer disconnected from power supply

Printing is possible in POWER ON mode only.
To activate POWER ON with the printer being in STANDBY mode, press POWER. POWER ON will be activated via the PC interface.
If no print job is received within a certain period of time, the printer automatically switches over to STANDBY mode. After switching from STANDBY mode to POWER ON mode, there will be a reduced print throughput until all systems have reached their proper operating temperature.

LOADED

To confirm a magazine exchange

Pressing **LOADED** briefly:
Informs the printer that an empty magazine has been refilled and put back into place. (Or that a magazine has been removed and replaced by another one containing cassettes of a different color).

Pressing and holding **LOADED** for approx. 10 sec. in offline mode:
Informs the printer that a cartridge has been exchanged.
(For more information, see Chapter 4.10, "Exchanging the cartridge").

ONLINE

Interrupting a print job in progress.

LED on:
Printer is ready and waiting for a new print job.

LED flashing:
A data transmission is in progress or a print job is being carried out.

- Pressing **ONLINE** while a print job is in progress interrupts printing. The current print job, however, is completed. The online **LED** goes out.
  At that point the printer can be accessed
  e.g. to remove a half-empty magazine and refill it).
- To resume the previously interrupted print job, press **ONLINE** again. The Online LED goes back on or—if there are still print jobs that have not been completed—the LED starts flashing.

LED off:
No data transmission in progress. Either no print job is in progress or a print job in progress has been temporarily interrupted.

ERROR

Acknowledging an error code being displayed.

LED flashing:
An error has occurred.
The corresponding error message is being displayed.

If **ERROR** is pressed after having eliminated the source of an error and after all obstacles in the processing areas have been removed, the printer resumes normal operation and the error indication disappears.
If several errors occur simultaneously, the highest priority error code is displayed first. After that error has been acknowledged by pressing **ERROR**, the second highest priority error code is displayed and so on.

CLEAN

Cleaning the print head and carrying out a print test

Pressing CLEAN briefly

While a print job is in progress:

- The print job is interrupted. "**00**" will appear in the display for about 2 s.
- A print head clean is carried out and subsequently the print job is resumed.

If no print job is in progress:

- A print head clean is performed immediately after "**00**" has been displayed.

Pressing the CLEAN button briefly and then releasing it starts a print head clean (indicated by "00" being displayed). The total duration of the cleaning procedure can be extended to 10 seconds, if CLEAN is pressed once more as soon as "00" is displayed. Hold CLEAN for as long you wish to continue cleaning (max. duration = 10 sec).

Pressing CLEAN for a longer period of time (minimum 3 seconds)

While a print job is in progress:

- The print job is interrupted. Printer switches to offline mode. "**00**" will appear in the display for about 2 s.
- A print head clean is performed and subsequently a test print is carried out on the cassette currently being processed. The printer then remains in offline mode to enable the user to verify the print quality before resuming the current print job.
  If necessary, an additional clean can be performed.

- To resume printing, press **ONLINE** to return to online mode.
- The print job is resumed where previously left off.

If no print job is in progress:

- The printer switches to offline mode.
- All steps are performed as described above.

When operating continuously, the printer pauses regularly for intermediate print head cleans. Printing is interrupted for approximately 10 seconds, after which time the instrument automatically resumes operation.

TRAY LOAD

If your printer is not equipped with an automated unload station, no function is assigned to this button!

Fig. 43

Function:

- The imprinted slides are pushed out of the printer and onto the uppermost tray.
- At the right end of the tray there is a sensor (**59**), which triggers a signal when covered (Fig. 32). The tray stack is then moved upwards by one tray.
- Once all trays are full, the instrument emits an acoustic signal (beep), the **LED** in the **TRAY LOAD** button starts blinking, the stack of trays can be removed.

Fig. 44

Controls the movement of the lifting table of the automated unload station (optional)

Place a stack of trays (**37**) onto the lifting table of the unload station (Fig. 43).
Any number of trays between 1 and 10 can be inserted, as the printer counts the trays when they are inserted.
Once the lifting table has reached its highest position, the **LED** in the button starts blinking.

Press and hold **TRAY LOAD** longer than 1 sec:

- The tray stack moves completely into the unload station, the **LED** in the button goes off, the printer switches to **ONLINE** mode.
- Pending print jobs will be carried out.

When the stack of trays has moved into the unload station completely or partly:

Press **TRAY LOAD** briefly

- The stack of trays moves up by one tray.

If **TRAY LOAD** is pressed and held longer than one second:

- The stack of trays moves completely out of the unload station, the **LED** in the button starts flashing. Any print job in progress is interrupted.

Every time the printer is switched on, the stack of trays automatically moves one tray up, to ensure that the new print job is started with an empty tray.

Be careful about getting near the sensor (59). Any object getting closer than 2 mm to the sensor will trigger a lifting movement.

5.2 Display indications

Display indication

Magazine empty (in combination with "Mag. Empty" LED)

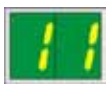
1 - Magazine no. 1 empty
2 - Magazine no. 2 empty
3 - Magazine no. 3 empty

If **"MANUAL FEED"** has been selected in the printer driver settings, **"0"** will appear in the display after the print job has been sent. The printer will wait for an individual specimen slide to be placed in the feeding chute for printing.

Display

Status messages

00 **Ink print head cleaning in progress.**



11 **Temperature in the flash power supply is too high.**
Printer is too hot—there will be a short cool-down period.
The print job will be resumed automatically after a short period of time.
To prevent frequent job interruptions due to heat build-up, make sure the ventilation grids of the printer are unobstructed and keep the printer away from other heat sources.
Consider operating the printer in an air-conditioned room.
If the temperature does not drop to a value within the allowed range within 10 minutes, "**55**" is displayed. Switch the instrument off and let it cool; check ambient temperature.

12 **Drying module temperature too low/too high.**
If the temperature does not drop to a value within the allowed range within 6 minutes, "**43**" is displayed.

13 **Flash bulb has reached its maximum life.**
The flash lamp has reached the end of its specified service life and must be replaced.
If this message is ignored, the resistance of subsequent printouts can be affected.

Status messages (continued)

Display

14 **Prompt requesting maintenance**
If this message is displayed, the instrument will be due for maintenance within the next few weeks. Confirm the prompt pressing **ERROR**.
After about 3 weeks the message will be displayed again and will not disappear from the screen when pressing **ERROR**.
You can still continue printing but maintenance must be carried out urgently.

15 **Cleaning the print head**
Screen prompt requesting the operator to manually clean the print head (cleaning swab + alcohol).
The printer is off-line. No new print jobs are accepted.

87 After the last **cartridge change, CLEAN** has been pressed to indicate to the printer that a cleaning cartridge has been inserted. The printer has received a print job but is unable to print because the cartridge contains cleaning fluid instead of ink.
Remedy:
Cancel the print job. Switch the printer off and back on and change the cartridge. Then press **LOADED** or **ERROR** and wait for 2 minutes.

88 **Ink cartridge has been changed**, device waits for confirmation with **ERROR**, **CLEAN**, or **LOADED** key.

Caution!
NEVER press LOADED after reinserting an ink cartridge which has already been used. This could cause permanent damage to the printer.

Warning: Problem with cassette ejection from a magazine

81 ⇩ **83** The display consists of two parts: The "**8**" is a warning that a magazine ejector is mechanically blocked. The second digit of the message gives the number of the affected magazine.

Error messages

All displayed numbers between **20** and **78** and **89** and **93**.

5.3 Alarm functions

The Leica IPS is equipped with two different alarm functions:

Instrument alarm

The printer has a beeper that emits acoustic signals indicating important instrument states and functions.

- Upon pressing the button: 1 short beeping sound
- Magazine empty/tray stack full: 2 short beeping sounds
- In case of error: 5 short beeping sounds
- When ending the head cleaning: 5 short beeping sounds

Back panel of instrument

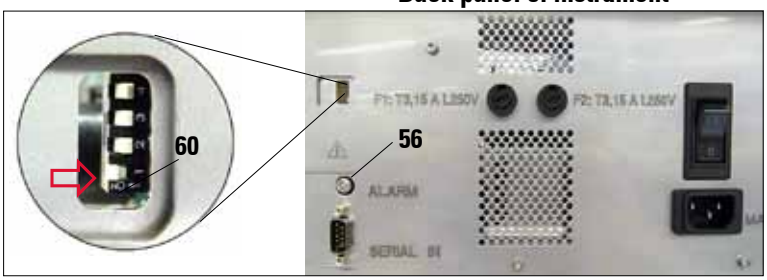


Fig. 45

The beeper can be deactivated by means of the DIL switches at the back panel of the printer.

To deactivate the beeper, push the switch at the very bottom (**60**) to the right (in the direction of the red arrow in Fig. 45).

Remote alarm

Additionally, an alarm can be installed outside the room in which the printer works.

- The remote alarm device is connected to the printer via a 3.5 mm-diameter jack connector (optional accessory) that is inserted into socket (**56**).
- The remote alarm is triggered if no power is supplied to the printer or if the power switch at the back panel of the printer is switched off.

The remote alarm device connected to the instrument must be rated at less than 100 mA. A maximum voltage of 24 V DC must not be exceeded.
For details on how to connect a remote alarm device to the Leica Printer IPS, please contact your local Leica sales office or the manufacturer directly.

5.4 Printer driver settings

With the Leica IPS slide printer you can print slides from any Windows application allowing the user to individually configure the printing parameters. The description below refers to Microsoft Wordpad, a program that is part of any Windows installation and therefore available on all PCs supported by the printer driver. The dialog boxes to be accessed in other programs may be named differently, but the driver parameters that need to be selected are named identically in all programs.

Configure the printer in the application that will be used for imprinting the slides.

1. Open the **Print** dialog box:
   FILE --> PRINT
2. From the list of available printers, select Leica IP S (the name of that printer was added when installing the printer driver, see Chapter 4.11) and confirm by pressing the corresponding button.

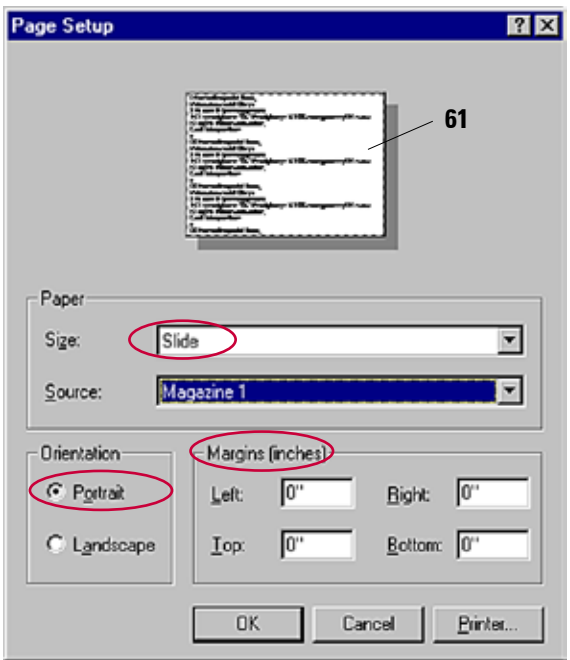


Fig. 46

1. First, the page settings must be selected. Click on **FILE** --> **PAGE SETUP** to open the Page Setup dialog box (Fig. 46).
2. In **MARGINS (inches)**, set all margins to "0""; the print range (**61**) will change as shown in Fig. 46.
3. In **ORIENTATION**, select **PORTRAIT**.
4. Once the printer has been set up as described above, the **SLIDE** format will automatically be shown in the **SIZE** input field in the **PAPER** dialog box.
5. In the **SOURCE** input field you can select the magazine(s) which will supply the slides to be imprinted.

Selectable options in the PAPER --> SOURCE dialog box

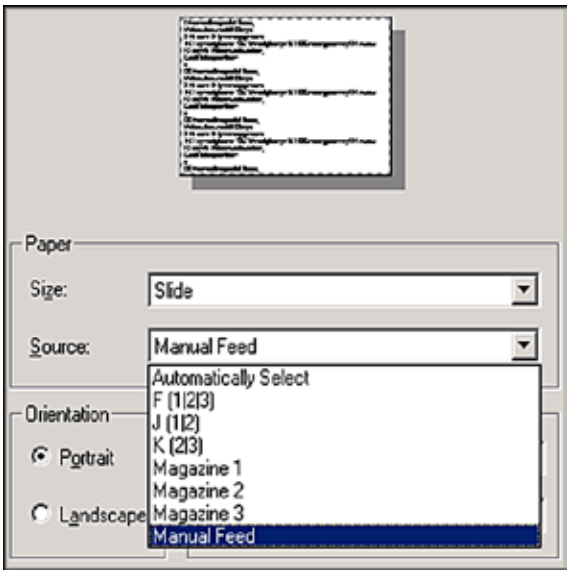


Fig. 47

When clicking on the Source input field, an alphabetical list of all cassette supply options from all 6 magazines opens up.

- **MANUAL FEED** means that individual slides will be placed onto the chute (**12** in Fig. 3) and imprinted. The printer will not start printing until the sensor (**13** in Fig. 3) reacts.
- Further options are magazines 1 through 6. If a particular magazine has been selected as supply source, printing will stop once that magazine is empty.
- If a group of magazines is selected (such as **F** (1|2|3)), printing will continue until the last magazine of the group selected is empty, i.e. printing will not stop when just one magazine is empty.

Working with magazine groups makes sense for large print jobs requiring more slides than fit into one magazine or when several magazines have been filled with slides of the same type (e.g. same color). The magazines will be processed in the indicated order.

Advanced Options

- To select advanced parameters, click on **PRINTER...** to access the printer selection menu. Click on **PROPERTIES...** and **ADVANCED...** to access the **ADVANCED OPTIONS** menu.

The ADVANCED... button does not exist under Windows NT 4.0. Clicking on PROPERTIES... in Windows NT leads you directly into the ADVANCED OPTIONS menu.

"ADVANCED OPTIONS" menu

Clicking onto the individual menu items opens up a pull-down menu to their right, where you can select the desired parameters.
Any menu items not described here are of no importance for the printer. Therefore, the standard settings of all menu items not described here should remain unchanged.

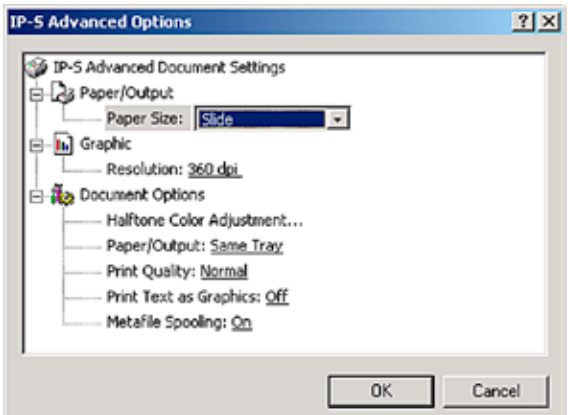
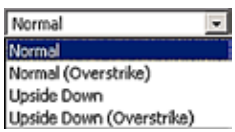


Fig. 48

- **PRINT QUALITY** menu item

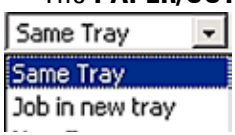


In this menu, you can select whether an imprint is to be applied onto a specimen slide once (**NORMAL**) or twice (**OVERSTRIKE**).
UPSIDE DOWN imprints are rotated 180°. Here again, **OVERSTRIKE** can be selected.

- In the **PAPER SIZE** menu you select the size of the imprintable zone of the slide. **Slide** must be selected in this menu, otherwise printing will not be possible.

- Selectable print head **RESOLUTION** settings are 360 and 180 dpi. With slide surfaces not appropriate for 360 dpi resolution, printing results will be poor. For such cassettes, 180 dpi should be selected.

- The **PAPER/OUTPUT** menu item is important above all for the multi-cassette unload station.



- **SAME TRAY**:
  slides keep being deposited into a tray until the tray is full.
- **JOB IN NEW TRAY**:
  each print job starts with a new tray.
- **NEW TRAY**:
  Only for special applications—**do not** select this option under standard Windows programs.

Due to the higher ink consumption and the substantially poorer printed image, the OVERSTRIKE setting may not be used.

When using the manual unloading system, the values configured in the PAPER/OUTPUT menu item are not considered by the device.

6.1 Cleaning the instrument

Prior to cleaning the instrument, always switch off power supply and unplug the power cord!
When handling cleaning detergents, follow the instructions of the manufacturer and make sure all laboratory regulations in force in your country are complied with.
To clean the exterior surfaces, use a mild and ph-neutral commercial household cleaner. You may NOT use: Alcohol, cleaning materials containing alcohol (glass cleaner!), abrasive, and solvents containing acetone or xylene! The painted surfaces and the control panel of the instrument are not resistant to xylene or acetone!
No liquid may come into contact with the electrical connections or spill into the interior of the instrument!
During all cleaning procedures, puncture-resistant gloves and eye protection are to be worn to protect against injury caused by debris (especially glass).
During vacuuming, direct the air stream generated by the vacuum away from yourself or anyone in the area to avoid possible injury from glass particles.

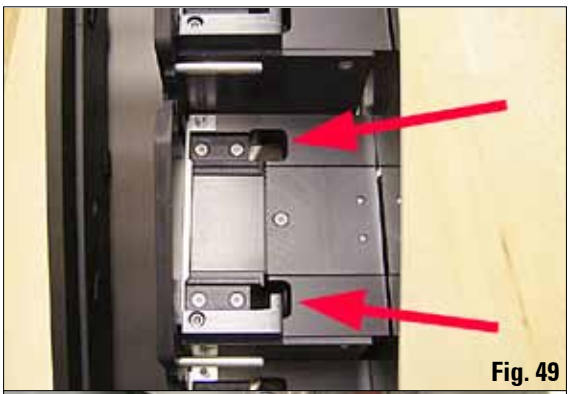


Fig. 49

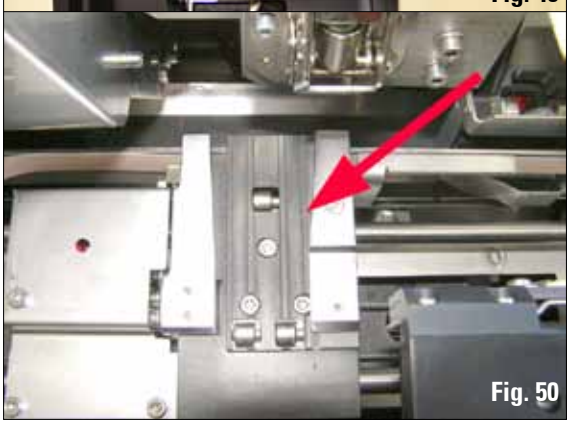


Fig. 50

Slide guiding mechanisms

The IP S needs to be cleaned with a small vacuum daily in the case of heavy use (or weekly in the case of light use) to remove any debris, especially glass dust.

Cleaning of the following IP modules signed by an arrow is of particular importance:

- Loading station (Fig. 49)
  The ejection unit of the magazines, magazine holders and chute. Always ensure that the sensor at the end of the chute is clean.

- Transport station (Fig. 50)
  Remove dust and debris from the specimen slide carrier.

Slide guiding mechanisms

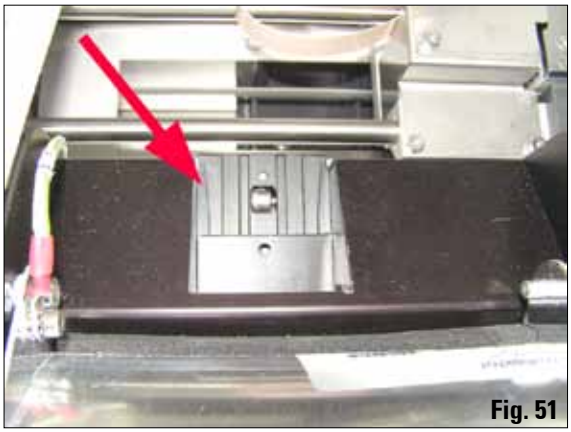


Fig. 51

- Drying station (Fig. 51)
  The chute must be clean.

Caution!
Sensitive electronics components are located in this area.
Use no liquid in this area!

Drawer for broken glass

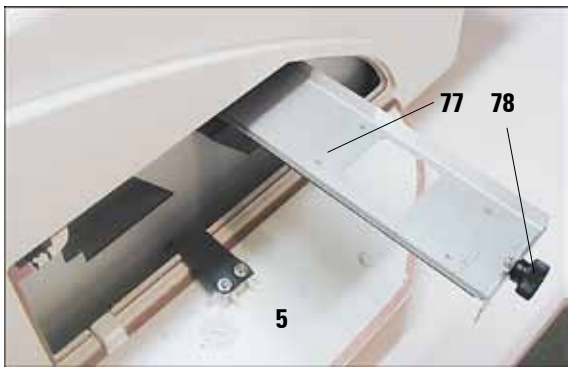


Fig. 52

- The drawer for broken glass (**77**) is located above the slot for the ink cartridge, behind the left cover (**5**). It prevents glass dust and broken glass from falling into the interior of the instrument. The drawer can be pulled out sideways by grasping the black handle (**78**) and must be cleaned regularly (Fig. 52).
- Broken glass can easily be removed - use a brush and remove any glass through the opening in the center of the drawer.

Automated unload station

- Remove the unload trays; with a brush, remove dust and debris from guides and ejector.
- The trays themselves can be cleaned with a household cleaner.
- Do not use any solvents to clean the trays!
- Prior to reinserting them into the instrument, the trays must be completely dry.

Outer surfaces

- Clean the outer surfaces (including those of the automated cassette unload station) with a mild detergent and subsequently dry with a slightly moistened cloth.
- Do not use any solvents for cleaning the outer surfaces and the lid!

6.2 Clean print head

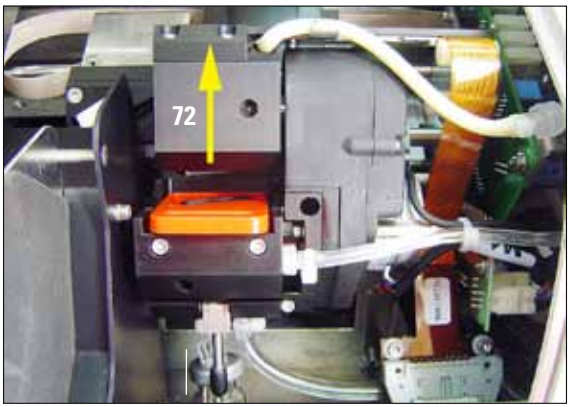


Fig. 53

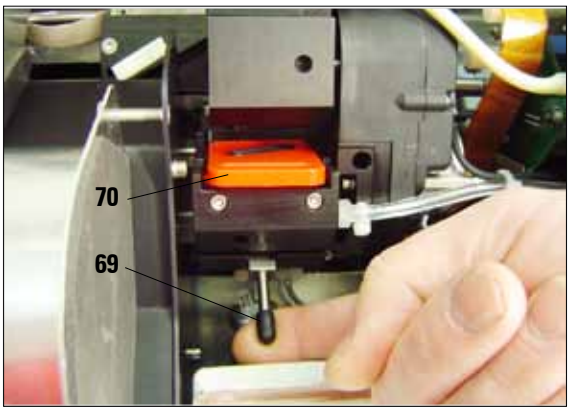


Fig. 54

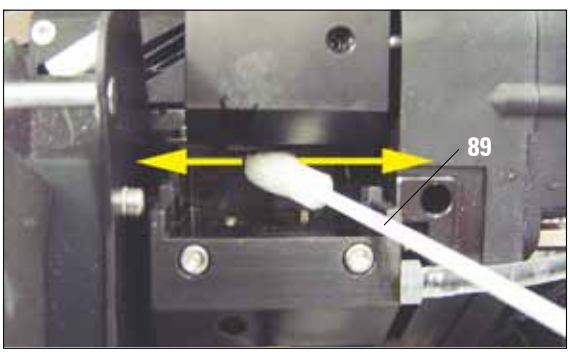
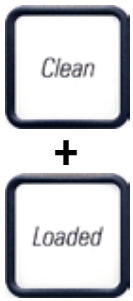


Fig. 55

Preparing the printer

Once a week or if message "**15**" is displayed, the print head must be cleaned manually.



- Open the printer lid and then press buttons **CLEAN** and **LOADED** simultaneously.
- The print head (**72**) moves upward to a position approx. 1 cm away from the sealing lip (Fig. 53).

- Push the lever (**69**) upwards, then remove the red location plate (**70**) with the sealing lip (Fig. 54).
- Moisten one of the foam swabs supplied with the instrument (**73**) with some alcohol. Be sure not to use too much alcohol—no alcohol may drip into the instrument.

Never use acetone or xylene! Only use alcohol 95% or 100% for cleaning purposes.

- Carefully insert the swab (**89**) into the gap under the print head and apply **light** pressure upwards (on print head) and move the foam swab back and forth (Fig. 55) (approx. 10 times!).

  This procedure removes dried ink residues.

Never rotate the swab—this can damage the nozzle plate of the print head.

Location plate

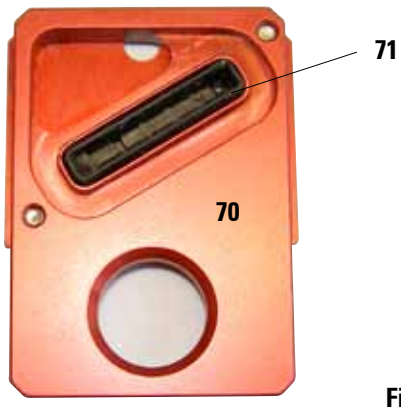


Fig. 56

- Also clean the location plate (**70**) and sealing lip with (clean) alcohol. The sealing lip (**71**) must be completely clean—no ink residue must be left. Check the sealing lip for damage. Replace the location plate if the sealing lip is damaged.
- Reinsert the location plate (**70**).
  Caution!
  The location plate must be completely dry.
- When the cleaning process is finished, press any key of the control panel to confirm.
- The print head moves back to parking position—message "**15**" disappears from the display. The printer is once again ready for printing.

If no button is pressed to acknowledge the end of the cleaning procedure, the print head will be closed automatically after a few minutes to prevent it from drying out.

- However, the message "**15**" remains in the display, as the instrument assumes that the cleaning has not been carried out.

6.3 General maintenance

Only authorized and qualified Leica service personnel may repair the instrument and access the instrument's internal components.

The Leica IP S printer is virtually maintenance-free.
To ensure smooth operation of the instrument over many years we do recommend the following:

- Clean the instrument thoroughly on a daily basis.
- Regularly remove dust from the ventilation slots on the back of the instrument using a brush or a small vacuum cleaner.
- Have the instrument inspected once per year by a qualified service engineer authorized by Leica.
- At the end of the warranty period, enter into a service contract. For more information, please contact your local Leica technical service center.

6.4 Storing the printer

If the printer is not used for a long period of time (up to three months), the following instructions are to be followed.

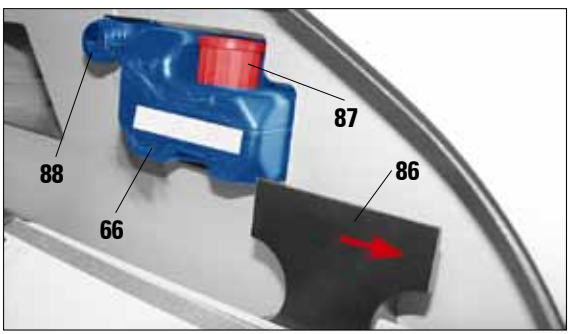
Important!

- If the instrument **remains connected to the power supply with the power on**, the ink cartridge can remain in the printer up to its expiration date.
- The print head drying out is prevented, because the printer regularly rinses the print head.
- You must absolutely ensure that the ink cartridge is switched out according to its expiration date.

If the instrument is switched off and separated from the power supply, the following is to be done:

A printer may be stored for a maximum of three months after following the procedure described below. Storing the printer for longer periods may result in damage to the print head.

Instructions on the storage location



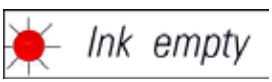


Fig. 57

The ink cartridge cannot be used in another printer, because the ink level information is stored in the printer itself.

- Open the cover plate (**5**) on the left side of the instrument by pressing its top left corner (see Fig. 31). Then push the security latch (**86**) forward (Fig. 57).
- Pull the ink cartridge (**66**) approx. 3 cm out of the instrument so that the "Ink Empty" **LED** lights.
- Screw the red cap (**87**) to the shutter (**88**), close it securely and take the ink cartridge out completely.
- Store the ink cartridge in a horizontal position in a sealed container.

Instructions for storage (continued)

Fig. 58

- Push a (new) cleaning cartridge as far as it will go into the shaft (Fig. 58).
- Unscrew the red cap (**85**) one turn and slide the cartridge fully home.
- Push the security latch (**86**, Fig. 57) back in front of the cartridge.

- The "Ink Empty" **LED** will go out and "**88**" will appear on the display.

- Press **CLEAN** to rinse the print head; "**00**" will appear on the display. The display will go out when the cleaning process is complete.

The cleaning process with solvent takes approx. 3.5 minutes.

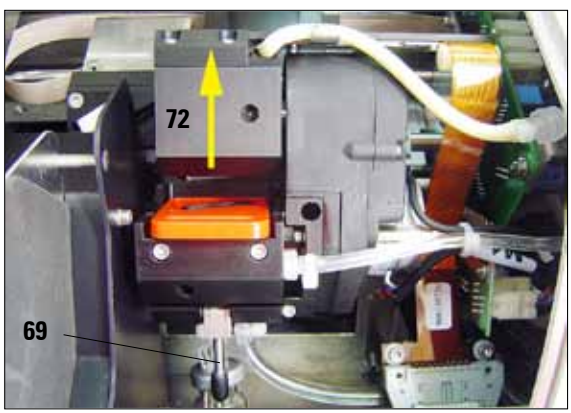
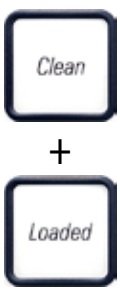


Fig. 59



- Open the hood of the printer (**4** in Fig. 31), then press the **CLEAN** and **LOADED** keys simultaneously.
- The print head (**72**) moves upward to a position approx. 1 cm ($^1/_2$ inch) away from the sealing lip (Fig. 59).
- Push the small lever (**69**, Fig. 59) upwards under the print head.

Instructions for storage (continued)

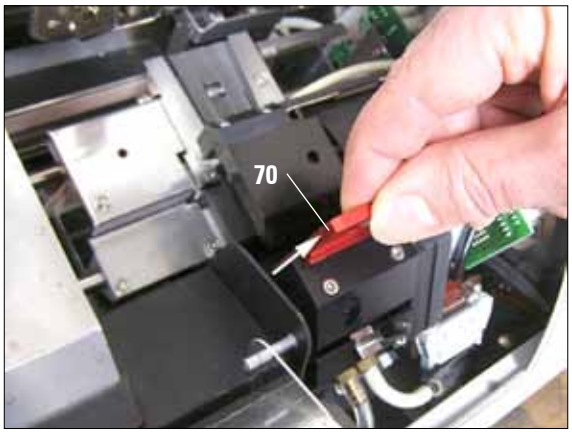


Fig. 60

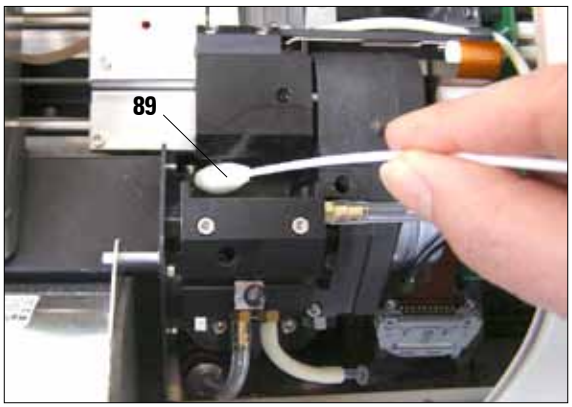


Fig. 61

- Then pull out the location plate (**70**), (Fig. 60).
- Clean the print head with a foam swab, as described in Chap. 6.2, "Cleaning the print head" (see also Fig. 61).

Always use the cleaning swab for the print head once only. Never rotate the swab—this can damage the nozzle plate of the print head.

- After cleaning the print head, insert a **new** transport plate (**73**).
- Push the small lever (**69**, Fig. 59) back down into its original position.
- Reclose the lid of the printer and press any key; the print head moves back into the rest (park) position.
- Screw the red cap (**85**, Fig. 58) to the shutter, close it securely, and take the ink cartridge out completely.

Important!
Turn the printer off and disconnect it from the power supply at this point to prevent damage to the print head.
Never use a cleaning cartridge together with a location plate (70)!
Do not reinstall a used transport plate (73), as it will no longer completely seal the print head.

Instructions for storage (continued)

Fig. 62

- Likewise, clean the removed removable disk (**70**) with the sealing lip with (clean) alcohol and a cleaning swab (**89**) (Fig. 62).
- The sealing lip (**71**) must be completely free of ink residue. Check the sealing lip for damage. Do not reuse a replacement plate with a damaged sealing lip.
- Clean the instrument completely, as described in Chap. 6.1.

Transporting the printer

If the printer is to be shipped, the storage instructions described above are to be carried out completely. Then, additionally make the following preparations:

- Open the hood (**4**, Fig. 31) of the printer and loosen the screw of the flash cover.
- Afterward, take out the flash bulb (refer to Chapter 4.7)
- Close the flash cover and the hood.
- Use original packaging and securely screw the printer to the baseplate (see unpacking instructions).
- Reinsert the transport anchor (**27**) (see Fig. 12) and secure the hood with adhesive tape.
- Make sure that the instrument is only transported upright.

7.1 Malfunctions

If the printer malfunctions during printing, a corresponding error code is displayed and simultaneously the LED in the ERROR button starts flashing.

How to eliminate the problem:

- Determine the cause of the error—see error list (Chapter 7.3).
- Remove obstruction(s); open lid if required.
- **Important!**
  Remove all slides which are still in the chute, in or next to the specimen slide carrier or in the drying module!
  These specimen slides should not be used again.

Confirm elimination of error

- Reclose the hood and press the **ERROR** button to confirm to the printer that the source of the error has been eliminated.
- The printer then verifies whether all processing paths are unobstructed and whether the source of the error has been eliminated.
- If there are still some obstructions left, or if the source of error has not been thoroughly eliminated, the printer displays another error message.
- Interrupted print jobs are resumed where previously left off.
- If an error message is displayed several times although all possible causes have been eliminated, a Reset should be carried out.

Reset:

- Press and release **LOADED** and **ERROR** simultaneously.
- A Reset restores the printer to the same state as directly after switching on. All print jobs in the print queue are deleted.
- If the same error continues to be displayed even after a Reset, switch the printer off via the power switch (back panel) and, after a short waiting period of approx. 30 sec., switch it back on. If this does not eliminate the problem either, call Leica Technical Service.

7.2 Status messages

(For additional information, refer also to Chap. 5.2)

Display code	LED	Meaning
	"Mag. empty flashing"	The printer is waiting for an individual cassette to be placed in the feeding chute for printing.
	"Mag. empty flashing"	Magazine No. 1 empty
	"Mag. empty flashing"	Magazine No. 2 empty
	"Mag. empty flashing"	Magazine No. 3 empty
	–	Ink print head cleaning is in progress.
	–	Temperature in the flash power supply is too high.
	–	Drying module temperature too low / too high.
	–	Flash bulb has reached its maximum life. (See also Chapter 7.4)
	–	Prompt requesting maintenance.
	–	Prompt to carry out a head cleaning.
	"Ink empty" flashing	Ink cartridge has been changed; instrument waiting for confirmation via **ERROR**, **CLEAN**, or **LOADED** button.

7.3 Error messages

Display code	Source of error	Troubleshooting solution
	Magazine output mechanically blocked.	Remove the cause of the blockage.
	Faulty ejection of a slide. Magazine output blocked.	Remove the slide.
	Transfer of a slide from the chute to the specimen slide carrier failed. Horizontal motor either incorrectly positioned or mechanically blocked.	Remove the slide.
	Slide is stuck in the feeding chute.	Remove the slide.
	Horizontal drive is mechanically blocked.	Remove the slide.
	Vertical drive is mechanically blocked.	Remove the slide.
	Rotational motion is mechanically blocked.	Remove the slide.
	Slide not correctly clamped in specimen slide carrier. Slide did leave the feeding chute but did not reach the specimen slide carrier.	Remove the slide from the specimen slide carrier.
	Slide did not leave the specimen slide carrier or was still located in the specimen slide carrier during initialization.	Remove the slide from the specimen slide carrier.
	The ink print head is getting too hot. Ambient temperature too high or electronics defective.	Switch instrument off and let it cool off. The instrument remains disabled until the print head has cooled down to a temperature value within the permissible range. Check ambient temperature.
	No or incorrect voltage at ink print head.	Call Leica Technical Service.

Error messages (continued)

Display code	Source of error	Troubleshooting solution
	Cover (4 in Fig. 2) not closed properly. Safety switch triggered.	Ensure that the cover is not blocked, e.g. by the manual unload station. Close cover completely.
	Flash standby state not reached within the prescribed time. Charging electronics defective.	Call Leica Technical Service.
	No flash or flash duration too short. Flash bulb dirty or defective.	Check whether flash bulb works – to do so, observe the stray light on the cover. **Never open the cover to check whether a flash is triggered!** No flash --> install a new flash bulb. See Chapter 4.7.
	The temperature in the drying module is not within the permissible temperature range.	**Carry out a** RESET. See Chapter 7.1.
	Unload station mechanically blocked.	Remove the cause of the blockage.
	Heater fan not running or running too slowly.	Call Leica Technical Service.
	No slide in the drying module for flashing. Slide left the specimen slide carrier, but did not reach the drying module.	Remove the specimen slide.
	Slide not successfully ejected from drying module.	Remove the specimen slide.
	Slide in the drying module during initialization or prior to a print job being carried out.	Remove the cause of the blockage.
	The flap of the drying module either does not close or does not open; flap is blocked (e.g. by a slide).	Remove the cause of the blockage.
	Lifting table end sensor does not switch.	Call Leica Technical Service.
	Lifting table position sensor does not switch during positioning.	Call Leica Technical Service.
	Flash power supply: Overtemperature for more than 10 minutes.	Call Leica Technical Service.

Error messages (continued)

Display code	Source of error	Troubleshooting solution
	Faulty control data received (program bug) Settings for the serial interface incorrect or the instrument configuration conflicts with the PC configuration.	**Carry out a RESET** on the printer. Check cable connection to the PC. Check configuration of serial port of the PC and reboot the PC.
	Transmitted data do not contain confirmation of receipt or data transmission was not confirmed by the PC.	Follow the same procedure as for **ERROR 60**. Try another printer cable.
	Print image exceeding the vertical limit.	Error caused by application software.
	Print image exceeding the horizontal limit.	Error caused by application software.
	The CRC test of the EEPROM returned an error when the instrument was switched on.	Call Leica Technical Service.
	Internal firmware error or defective controller.	Call Leica Technical Service.
	Mechanical problem makes ejection of cassettes from magazine difficult.	Check ejection mechanism. Remove foreign bodies, then clean with brush.
	A print job was attempted with a storage fluid cartridge inserted.	Remove storage cartridge and insert ink cartridge. Insert ink cartridge and press **LOADED** to confirm. (See Chapter 4.9)
	Power supply unit does not achieve standard operating voltage.	Call Leica Technical Service.
	Firmware only partially loaded or not loaded at all. Flash memory defective.	Call Leica Technical Service.
	Wrong firmware.	Call Leica Technical Service.

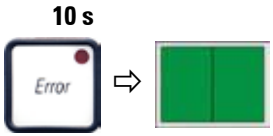
7.4 Changing the flash bulb

Code **13** is displayed when the flash bulb has reached its maximum serviceable life.

When code 13 is issued, the bulb has to be changed.

For details on how to insert / replace the flash bulb, please refer to Chapter 4.7.

Before replacing the flash bulb, switch off the printer and unplug the instrument from power supply.



After changing the bulb, switch the printer back on.

Then go to Off-line mode and press and hold the **ERROR** button for 10 seconds - code **13** disappears from the display.

7.5 Power failure

Fig. 63

Fig. 64

- Check whether there is a general power failure (no power).
- Check whether the power plug is inserted correctly into the wall outlet and whether the wall outlet is switched on, if applicable.
- Check whether the power switch is switched on correctly. Possibly, the primary fuse has tripped. If so, the main switch will be in **"0"** = **OFF** position (Fig. 63).
- Check whether one of the two secondary fuses is defective. (**F1**, **F2** located at the back panel of instrument, Fig. 64, see also Fig. 65).
  Some instrument malfunctions / failures are caused by defective fuses.

Malfunction / failure	**Fuse to be checked**
• Instrument not functioning. • No display indication.	Fuse **F1**
• Instrument not working at normal speed. Printing a slide takes approx. 8 sec., even after the warm-up phase has been completed.	Fuse **F2**

7.6 Replacing the fuses

Before replacing a fuse, always switch the instrument off and unplug from power supply. Defective fuses may be replaced only with the replacement fuses supplied together with the instrument.

Replacing the fuses

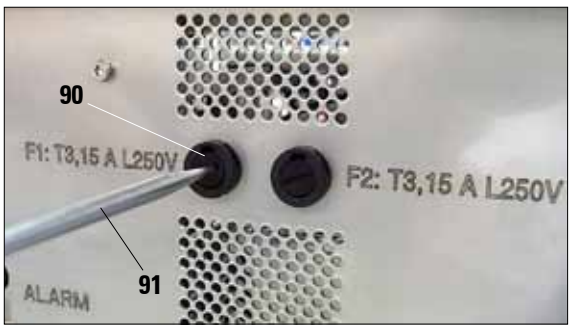


Fig. 65

Fig. 66

- Insert a screwdriver (**91**) into the slot in fuse holder (**90**); push slightly inwards and at the same time rotate the screwdriver 1/4 turn to the left.
- The fuse holder is released and can be removed.
- Remove the defective fuse (**92**) from the fuse holder (**90**) and insert the correct type replacement fuse.
- Reinsert the fuse holder together with the fuse. Insert the screwdriver into the slot in the fuse holder, push slightly inwards and at the same time rotate the fuse holder 1/4 turn to the right.

Warranty

Leica Biosystems Nussloch GmbH guarantees that the contractual product delivered has been subjected to a comprehensive quality control procedure based on the Leica in-house testing standards, and that the product is faultless and complies with all technical specifications and/or agreed characteristics warranted.

The scope of the warranty is based on the content of the concluded agreement. The warranty terms of your Leica sales organization or the organization from which you have purchased the contractual product shall apply exclusively.

Technical service information

If you require technical service or replacement parts, please contact your Leica sales representative or dealer who sold the product.

Please provide the following information:

- Model name and serial number of the instrument.
- Location of the instrument and name of the person to contact.
- Reason for the service call.
- Date of delivery.

Shutdown and disposal of the instrument

The instrument or parts of the instrument must be disposed of in compliance with the local laws.

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